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JANUARY/FEBRUARY 1984 / \$2.25



Photographing carrier-deck action on dry land

Converting a 1/35 scale LVT(A)5 to an LVT(R)-X1 recovery vehicle



1/48 scale drawings of Vultee's P-66 Vanguard

Dealing with decals

Modeling water with artist's acrylic gel

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CENTURION Mk. 10 SR-3511 \$9.98

Lacking a high performance tank such as the Sherman of the U.S. the British debuted the CENTURION to answer the need for a speedy production tank with good fighting power. Initially the CENTURION was inferior to other tanks of the same class. The CENTURIONS were eventually equipped with 105mm guns and gained widespread fame. In the Middle East in 1967, CENTURIONS formed the main body of the Israeli army, easily destroying T34 and T54 tanks. Their excellent fighting capabilities are known throughout the world.



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ON THE COVER

David Tipps' dramatic sunrise photo was taken not on a carrier deck but on a simple photo prop set up near his Miami home, and the A-7E Corsair and A-1 Skyraider are both Monogram 1/48 scale models. You'll learn how David built the carrier deck and shot the photo in the article that begins on page 56. While Dennis Moore's 1/400 scale Heller *Dunkerque* is no stranger to FSM (it appeared on the cover of our Winter 1982 issue), the way Dennis modeled the water around the ship (page 60) is new — and worth trying. Photos by David Tipps and FSM Staff Photographer Paul A. Erler.



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PRACTICAL BOOKS FOR MODELERS



- ☐ **Scale Model Aircraft for Radio Control**, 300 pp, 250 illus., \$19.95
- ☐ **The Glassfibre Handbook**, 160 pp, 150 illus., \$13.95
- ☐ **Modelling Commercial Vehicles**, 140 pp, 126 illus., \$9.95
- ☐ **Airbrushing and Spray Painting Manual**, 175 pp, illus., \$13.95
- ☐ **The Cutty Sark**, 496 pp, illus., \$16.95
- ☐ **Manual of the Waffen SS**, 96 pp, illus., \$5.95



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FSM UPDATE

FSM invites manufacturers and publishers to submit news releases, photos, product samples, and new catalogs. Send all material to FSM Update, FINESCALE MODELER, 1027 North Seventh Street, Milwaukee, WI 53233.

FSM now bimonthly. Effective with this issue, FINESCALE MODELER will be published six times per year. Six-issue subscriptions are available for \$11.00 (\$14.00 outside the United States), while 12-issue subscriptions cost \$20.00 (\$26.00 outside the U. S.).

Kit releases. Brooklin Models, Twerton Mill, Lower Bristol Road, Bath, Avon, BA2 1EW, England, sells 1/43 models of classic and special interest cars produced in the United States from the 1930s to the 1950s. The cars are cast in white metal and are fully finished for display.

Recently released vacuum-formed kits from Combat Models, Inc., 1633 Marconi Road, Wall, NJ 07719, include No. 32-042,



1/32 Convair F-102 Delta Dagger, \$23.95; 32-043, 1/32 Convair F-106 Delta Dart, \$23.95; 48-048, 1/48 P4M Mercator, \$24.95; 72-070, 1/72 German Mk. XXI U-boat, \$24.95; and 72-104, 1/72 U. S. S-class submarine, \$23.95. Shipping costs are not included.

Diversified Little Products Co., 1037 Temple Road, Pottstown, PA 19464, sells 1/2" scale model construction kits to help the



builder learn how full-size houses are made. Each kit includes step-by-step instructions, reusable blueprints, balsa lumber, and simulated plywood underlayment. Construction accessories are also available.

Recent releases from The Ertl Company, Highways 136 and 20, Dyersville, IA 52040, are No. 6675DO, 1/468 *Star Trek* U. S. S. *Enterprise* (movie version), and 8043EO, 1/25 Darrell Waltrip Pepsi Challenger Mon-

te Carlo. The finished *Enterprise* model is 22 3/4" long, 10 1/8" wide, and 5 1/2" tall — when mounted on the display stand, which is included, the model is 8 1/2" tall.



Four Tamiya releases from Model Rectifier Corporation, 2500 Woodbridge Avenue, P. O. Box 267, Edison, NJ 08817, are No. 2017, 1/20 Brabham BT50 BMW turbo racing car, \$14.98; 2435, 1/24 Nissan Fairlady



280 ZT T-bar roof pace car, \$13.98; 3625, 1/35 M15A2 Mutt with tow missile launcher, \$7.98; and 6427, 1/48 Mitsubishi A6M5c Zero Fighter (Zeke), \$9.98.

Recent releases from Monogram Models, Inc., 8601 Waukegan Road, Morton Grove, IL 60053-2295, include kit No. 1407, 1/24 "Simon & Simon" Snap-Tite Z/28 Camaro;



2222, 1/24 1983 Mustang GT convertible; 2233 and 2234, modified Chevrolet van for the National Football League American Conference and National Conference, respectively; 2503, 1/16 Fruehauf flatbed trailer; 5504, 1/72 F-16 Thunderbirds team; and 5604, 1/48 B-24D Liberator. Monogram also has released five kits in its Heritage Edition series: 6051, 1/144 Apollo Saturn V rocket; 6052, 1/12 Wright Cyclone radial aircraft engine; 6053, 1/32 Grumman Gulfhawk; 6054, 1/32 P-51 Mustang; and 6055, 1/128 U. S. space missiles.

Pegasus, Strebor House, Thurston Park, Whitstable, Kent, England, sells short-run injection-molded kits. Included in Pegasus' 1/72 line are kit No. 002, Supermarine Spitfire F.22/24, \$7.00; 003, Siemens Schuckert D-III, \$7.00; 005, Fairey Fox Mk. I, \$10.00; 006, Hispano Ha 1112, \$7.00; and

007, Gloster Gamecock, \$7.00. The kits are distributed in the United States by the Triple Alliance, Bellevue, Washington; Streeter Hobbies, Columbus, Ohio; and Discount Hobbies, Kearney, New Jersey.

Revell, Inc., 4223 Glencoe Avenue, Venice, CA 90291, has released kit No. 4725, 1/48 B1-B bomber. Other releases include six 1/32 "Magic Glo Racers" which glow in the dark: 6121, Banshee; 6122, Scorpion; 6123, Vampire; 6124, Panther; 6125, Serpent; and 6126, Warlock. Recent releases in Revell's 1/25 "Street Demons" series are



7384, 1956 Ford F-100; 7387, 1941 Willys; 7391, 1926 sedan delivery; 7392, 1929 Model A pickup; 7393, 1954 Chevy panel; and 7395, Chopped Deuce.

Decals. Decal set No. AD-1 from Accu-Scale Decals, 3 Clayton Avenue, Medford, MA 02155, consists of two 8½" x 11" sheets of black U. S. letters and numbers, two 8½" x 11" sheets of white U. S. letters and numbers, and one 5" x 7" sheet of yellow U. S. numbers. The decals can be used with 1/32 and 1/48 aircraft. The set sells for \$12.50 plus \$.75 postage.

ATP Incorporated, P. O. Box 2891, South San Francisco, CA 94083, has added three sets of 1/144 decals to its line: No. AD5024, American Overseas Airlines Boeing Strato-cruiser, \$3.00; AD5036, Transamerica Boeing 747-200C or DC-8-73, \$4.50; and AD5041, Ozark DC-9, \$3.00.

Paints and adhesives. Krazy Glue Inc., 53 West 23rd Street, New York, NY 10010, now sells Krazy Glue in a 20-gram bottle with a dispenser tip.

A list of aircraft colors from Compucolor is available from Trade Exports Limited, 3 Jubilee End, Dale Hall Industrial Estate, Manningtree, Essex, CO11 1UR, England.

Wilco Associates, Inc., 1627 West 135th Street, Gardena, CA 90249, distributes the Hardman line of adhesives, including epoxies, acrylics, Kalex urethanes, and a fast-setting silicone, in addition to a hand cleanser which contains no harsh solvents or abrasives. These products are available in pre-measured, job-size packages.

Figures. Artistic Enterprises, 9 Winston Crescent, Whitby, Ontario L1N 6Y3, Canada, sells painted military miniature figures for all periods in scales ranging from 15 mm to 110 mm. Artistic Enterprises also will paint customers' own miniature figures.

Quick and Fabulous Ltd., Waldeck House, Waldeck Road, Maidenhead, Berkshire, England, has released 13 models of Sherlock Holmes characters. Each model is 12" high, cast in latex, hand-painted, and mounted on a wooden plinth. Accessories such as Holmes' pipe, magnifying glass, violin, and walking



stick are made of wood, leather, and metal. Each character model costs \$70.00; a handsome cab with horse and driver costs \$400.00. Postage is not included in these prices.

Accessories and diorama materials. New 1/24 products in the Curbside Dioramics line from R & D Unique, 14430 31st Street South, Seattle, WA 98168, include the RDA-2411 two-stage air compressor, \$12.00, and the RDA-2412 spray gun with air hose, \$1.65. The air compressor is a 22-piece cast metal kit; no assembly is required for the spray gun. Residents of the U. S. and Canada add \$.50 postage on orders less than \$10.00.

Yankee Junction, Station Street, Glen, NH 03838, sells a 24" x 72" cloud background for \$4.95.

Tools. Binks Manufacturing Company, 9201 West Belmont Avenue, Franklin Park,



IL 60131, now packages its Raven airbrush set in a cardboard box as well as a solid walnut box. Both sets include a 2 cc color cup, two fine needles, reamer, wrench, and airbrush hanger. The set packaged in cardboard sells for \$69.00; the set packaged in walnut costs \$82.00.

Cir-Kit Concepts, Inc., 608 North Broadway, Rochester, MN 55904, has released the No. 1043 Mini Pin Vise, \$1.98. It's made of anodized brass, has an adjustable chuck which will accept No. 60 through No. 80 drills, is 3" long, .3" in diameter, and weighs less than ½ ounce.

The new Multi-Color Air Brush Attachment (MCABA) from Crystal Diamond Enterprises, P. O. Box 98726, Des Moines, WA 98188, allows the user to select various colors from a single color container in no more than 5 seconds. Four separate colors plus cleaner can be fed in any combination to the airbrush via plastic tubes from an arm-mounted color tray. The MCABA will fit most side-cup, siphon, and gravity-feed airbrushes; it will not fit the Paasche AB airbrush. Model LD, for water-base paints, sells for about \$60.00. Model HD, for lacquers and oil-base paints, will be available soon.

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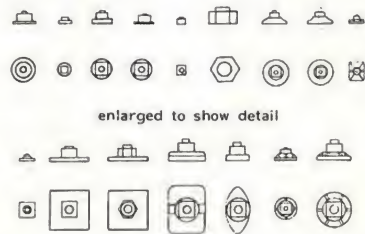
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Addis Elmore, P. O. Box 266, Mesquite,
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hand-held power sander to which steel
wands covered with adhesive-backed sand-
paper strips are attached. The device also
can be used for polishing and buffing. The
basic Wandit comes with a flat wand and
one each of six grits of sandpaper strips; it
sells for \$89.95.

Foredom Electric Company, Route 6, Beth-
el, CT 06801, has released two quick-change



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ball-bearing handpieces, Nos. 10 and 10D.
Both models take $\frac{3}{32}$ " shank accessories and
can be used with any of Foredom's mini-
ature flexible-shaft machines. For further in-
formation ask for catalog sheet 289.

Foredom Electric also has expanded its
line of rubber-bonded abrasive accessories.
New additions include wheels, edge wheels,
bullets, and tapered points in various sizes
and four grits — coarse, medium, fine, and
extra-fine. Also available are "stub" length
twist drills of high-speed steel. The drills
may be purchased in an 11-piece kit con-
taining 7 different sizes. For complete de-
tails on the rubber-bonded abrasive accesso-
ries and miniature drills write for catalog
sheet No. 290.

Häfele America Co., P. O. Box 1590, High
Point, NC 27261, now carries the Minitool
line of hand tools. The line includes an 11½-
ounce, 2-speed drill; a 13-ounce flexible
shaft tool with a shank that will accept bits
from $\frac{1}{32}$ " to $\frac{1}{8}$ " in diameter; an 8-ounce jig-
saw that will cut thicknesses up to $\frac{1}{4}$ "; a 6¼-
ounce orbital sander with a sanding face of
 $2\frac{1}{2}$ " x $3\frac{1}{2}$ "; and an 11-ounce angle grinder.

An extensive line of stencil and hobby
brushes produced by Loew-Cornell, Inc., 563
Chestnut Avenue, Teaneck, NJ 07666, is
now available in craft and hobby shops.

Magna-Lux II, a magnifier lamp, is avail-
able from B. G. Mandel, 70-20 108th Street,
Forest Hills, NY 11375, for \$42.95 plus
\$2.50 for shipping. The Magna-Lux II weighs
3 pounds, has an arm reach of 39", factory-
installed glass 3-diopter lens, 5" diagonally
measured lens, and a safety/dust lens cover.
An 8-pound base-with clamp costs \$12.95
plus \$4.50 for shipping.

Maxon Precision Tools, 750 Washington
Avenue, Carlstadt, NJ 07072, has intro-
duced its Mascot series of tools and tool sets.
Included in the series are the H865 knife set
with lightweight, medium weight, and
heavy-duty knives and ten extra blades in
seven sizes, and the H812 set with a pin vise
with a wood, ball-shaped swivel head and a
vial of six carbon steel drills in sizes 50
through 80.

Millers Falls Tool Company, P. O. Box
1030, Alpha, NJ 08865, sells a deluxe car-
ving set featuring five heat-treated, forged-
steel tools with maple palm-type handles,
sharpening stone, and case. The set includes
a $\frac{3}{8}$ " bent chisel, $\frac{3}{8}$ " skew bevel, $\frac{5}{16}$ " gouge,
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gested price is \$26.60. A set with standard hardwood handles and a $\frac{3}{8}$ " straight chisel is available for the same price.

Moody Tools, Inc., 42-60 Crompton Avenue, East Greenwich, RI 02818, has added an 8-piece cross-recess screwdriver set to its



Acu-Min line. The set, No. 58-0201, contains four cross-recess screwdrivers, in sizes 000, 00, 0, and 1, and four cross-recess blades with solid-locking, chuck-type, knurled, and plated steel handles. The blades are hardened, tempered, and plated tool steel.

Pacer Technology & Resources, Inc., 1600 Dell Avenue, Campbell, CA 95008, has introduced a $\frac{1}{2}$ fluid ounce "Miniature Blaster" size for Z-Foam Primer and Zip Kicker.

Adjust-It reading glasses are available from Pennsylvania Optical Co., 234 South Eighth Street, P. O. Box 1217, Reading, PA 19603. They feature adjustable earpieces that move in and out and up and down. The glass lenses come in eight focus powers.

Wahl Clipper Corporation, Sterling, IL 61081, has redesigned its ISO-TIP hobby drill. The 13,000 rpm drill features a higher speed motor and an improved 3-jaw chuck which can be adjusted to accommodate drills and burrs with a shank diameter up to $\frac{1}{8}$ ".



The drill weighs less than 5 ounces, is 6" long, and comes with a 9-foot cord.

Catalogs. A catalog listing an extensive line of 1/24 model truck and fire apparatus conversion kits, hand-crafted "Collectors Series" Mack trucks, parts, and decal sheets is available for \$5.00 postpaid from American Industrial Models, Box 165, McConnellsburg, PA 17233.

Arms and Armour Press, 2-6 Hampstead High Street, London, NW3 1QQ, England, has released catalog No. 29, a 48-page list of all titles stocked.

Catalog No. 36 is available for \$3.25 from Brownells, Inc., Route 2, Box 1, Montezuma, IA 50171; outside the United States it costs \$4.25. While this illustrated, 148-page catalog primarily lists gunsmithing tools and equipment, Brownells also carries items such as dental tools, Dremel tools, small files, drills, and magnifying lamps.

Conway Maritime Press, 24 Bride Lane, Fleet Street, London, EC4Y 8DR, England, offers a September 1983-February 1984, 32-page book catalog.

A free, 12-page Metals for Casting Models catalog is available from Arthur S. Green, 485 South Robertson Boulevard, Suite 5, Beverly Hills, CA 90211. The illustrated catalog covers the names, compositions, characteristics, and price list of metals for casting models, as well as how to work with these metals.

International Hobby Corporation, 350 East Tioga Street, Philadelphia, PA 19134, now imports the Roco line of 1/87 Z-series military miniatures, including tanks, trucks, helicopters, figures, and trees. An 8-page catalog showing approximately 200 models is available for \$2.00.

Send \$1.00 for a catalog which features more than 550 small hand tools to Micro-Mark, 24 East Main Street, P. O. Box 5112, Clinton, NJ 08809.

Northeastern Scale Models, Inc., P. O. Box 425, Methuen, MA 01844, has a free catalog listing miniature scale hardwood shapes available in basswood, mahogany, cherry, and walnut.

A 1983-1984 catalog is available from The Quartermaster, P. O. Drawer Y, St. Joseph, IL 61873. The 41-page catalog includes listings for kits, decals, figures, books, tools, adhesives, and paintbrushes.

The Reich Art, 3375 Jacques Street, Flint, MI 48504, sells a 20-page catalog for \$1.25. The emphasis is on German military books and art prints.

Series 77 Miniatures, 7861 Alabama Avenue, No. 14, Canoga Park, CA 91304, sells a newly enlarged, illustrated catalog featuring its entire product line of 77 mm, 90 mm, and 154 mm figures. The catalog costs \$4.50 plus \$1.50 for postage and handling.

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Sterling Publishing Co., Inc., Two Park Avenue, New York, NY 10016, has a free Fall 1983 book catalog. Included are books on militaria and transportation.

An illustrated catalog of adhesives and sealants is available from the 3C Company, 181 New Boston Street, Woburn, MA 01801.

Zenith Aviation Books, 729 Prospect Avenue, P.O. Box 2, Osceola, WI 54020, offers a free, 36-page 1984 catalog which lists more than 1300 books.

Miscellaneous. A 20" x 28" color print by John Ficklen of Erich Hartmann flying a Bf109G-6 is available for \$75.00 from Aero Graphics, P.O. Box 28583, Atlanta, GA 30328. Add \$3.00 for shipping and handling.

Armin Poly-Version, One Penn Plaza, New York, NY 10119, sells disposable plastic gloves with a double embossing pattern that allows air to circulate over the wearer's skin. There are 100 gloves in each dispenser bag.

Bowman Manufacturing, 743 Harvard Street, St. Louis, MO 63130, sells 40 mm and 54 mm stand-up cardboard figures and structures; card models of American and European landmarks; 54 mm single-cavity Zymac metal molds; and "Attack: the Blue/Gray Board Game," a Civil War game featuring stand-up cardboard soldiers, cannon, and wagons.

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GB Aircraft Slides, 4064 Farrier Court, Mississauga, Ontario, L5L 2Y4, Canada, publishes lists of available aircraft slides.

March Precision, Inc., 32841 Park Lane, Garden City, MI 48135, sells plastic, "no




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Time-Life Books, Inc., Time & Life Building, Chicago, IL 60611, is introducing a new series called *The Vietnam Experience*. Each volume sells for \$14.95 plus shipping and handling and is illustrated with color and black-and-white photographs, maps, and diagrams.

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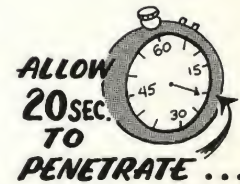
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FSM READER FORUM

Let us know what you think! Comments, suggestions, corrections, and additional information on FSM articles are welcome in this column. Letters submitted for publication should be clearly marked "To the Editor" on both the envelope and the letter, should be typed or hand-printed, and should be no more than 300 words long.

More thoughts on big models. After reading "From The Editor" [in the Summer 1983 FSM] I realized that I am hooked on big models. In the past I've built the Monogram B-29, B-17, B-24, and C-47, in 1/48 scale. At the present time, I am building the 1/24 MPC Mk. IA Spitfire, 1/32 Revell F-14 Tomcat, and the Revell 1/32 Harrier. For future projects I plan to get into smaller scales as I am quickly running out of display space.

However, I have a 1/24 Fw 190, also by MPC, and a 1/32 F-4 Phantom yet to build. I guess I enjoy the great amount of detail you can cram in these big ones. But, one setback is that there are usually more gaps to be filled in, not to mention the hours it takes just to assemble the big kits. One kit I would like to see in the future is a 1/32 scale B-25H, which I am ready to do a really massive superdetailing job on!

Bob Metz
Clarence Center, N. Y.

[As you doubtless already know, Bob, running out of display space isn't a problem unique to those who build large-scale models; it just happens sooner with bigger models! Incidentally, of the dozen or so letters we got on my "The start of something bigger?" editorial in the Summer issue, not one of them came out *against* bigger models. I'd expected someone would write in to take me to task for being in favor of larger scales, but nobody did. — B. H.]

Pleased with the balance. Just a short note to let you know how pleased I am with my subscription to FINESCALE MODELER. The magazine fills a void that has existed for years in the scale modeling hobby, and does so with an excellent balance of interesting and informative articles containing something for everyone.

In particular, Paul Boyer's recent article on filler putties [in the Summer 1983 issue] rates tops in my book, and has to be one of the best, most in-depth modeling features I've ever read.

Keep up the fine work on a terrific magazine.

Walt Fink
Crystal Lake, Ill.

Oops! FSM drops the ball. In the "Tips and Techniques" department of your Fall 1983 issue of FINESCALE MODELER, Shep Paine describes clip-on sanding discs to fit the Dremel tool. However, there is no mention of the address where one can get these from. Could you please provide me with the address where I might find the Merit clip-on sanding attachment?

Cyril Mazansky, M. D.
Newton Centre, Mass.

[Right you are! We neglected to mention an address for the Merit clip-on sanding discs. Here it is: Merit Abrasive Products, Inc., 201 W. Manville, P. O. Box 5447, Compton, CA 90224. Check your local hobby shop or hardware store first; I found mine at a hardware store.

Sorry that we dropped the ball on this bit of information; we'll try to do better in the future. — B. H.]

Help with the Doolittle raid. I am writing in response to Larry Neal's request in the Summer 1983 issue of FSM for information on the color schemes of the aircraft of the Doolittle Raid on Tokyo.

I too have researched the raid and I have found that Edward Jablonski's *Airwar, Volume 1, Terror From the Sky* provides some usable pictures of the aircraft. I have found that Testors Flat Army Olive slightly diluted with Flat Olive Drab accurately represents the color of the upper surfaces of the craft. Also, Testors Gray lightened with White provides a color very close to the color of the undersurfaces of the aircraft.

As for the markings, the planes were sparsely marked, with the blue and white roundels with the red dot in the center of the star on the fuselage and on both upper wings. "U. S. Army" was painted from left to right on the undersides of the wings, and the aircraft serial numbers were on the vertical stabilizers.

I know of no 1/48 scale kits of the Mitchell; however Testors offers an excellent 1/72

scale kit of a Doolittle Raider. Only slight modification to the tail section is necessary to complete this as a B-25B.

I hope this information will help Larry and any other modelers interested in constructing the aircraft of this historic bombing raid. Thank you.

David Myrick
White Hall, Md.

Undersea subjects, please. I have looked around for years for submarine kits and found virtually zilch, so that leaves me with scratchbuilding them. I have 15 of them so far. If you could run an article on subs or on more shipbuilding tips I would be grateful.

Del Brown
Wooster, Ohio.

Survey to prevent unwanted duplication?

In recent years, model companies here and abroad have released many excellent 1/48 scale aircraft. Many times, however, two or more companies release the same aircraft, while other aircraft types are completely neglected because their statistics indicate lack of demand by modelers.

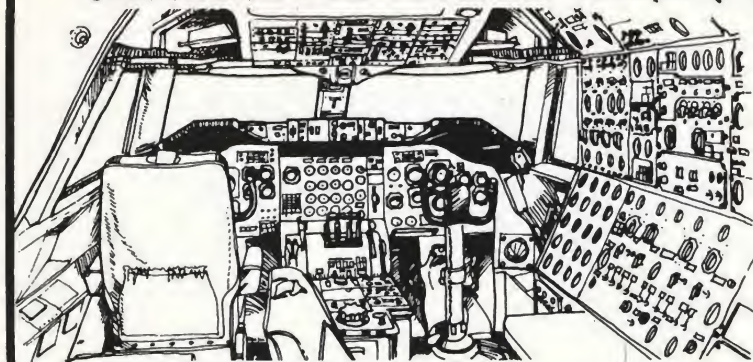
I'm not sure how much influence FSM and its readers have on this issue, but I would like to see some type of poll in FSM that may help change a model company's opinion on releasing models such as the following: MC202, Fiat CR42, Yak-3, and La-5.

Donald Thrans
Sunfield, Mich.

[We do plan an FSM Reader Survey in the near future, Don, but I'm afraid its purpose will be to find out what you readers like, dislike, and would like to see more or less of in FSM itself, not what kits FSM readers want most. However, a poll exactly like the one you've suggested has recently been conducted. In 1983 the International Plastic Modelers Society, United States Branch conducted a comprehensive membership survey which included a large, detailed section for kit requests and suggestions.

The tabulated results of the survey will be distributed to the major model manufacturers for consideration, and copies of the report are available for a modest charge from the IPMS/U. S. A. national office, P. O. Box 480, Denver, CO 80201. You'll be pleased to learn that you're not the only modeler concerned with duplication, and you've got plenty of company in wanting a Yak-3 and an La-5 in 1/48 scale! — B. H.] **FSM**

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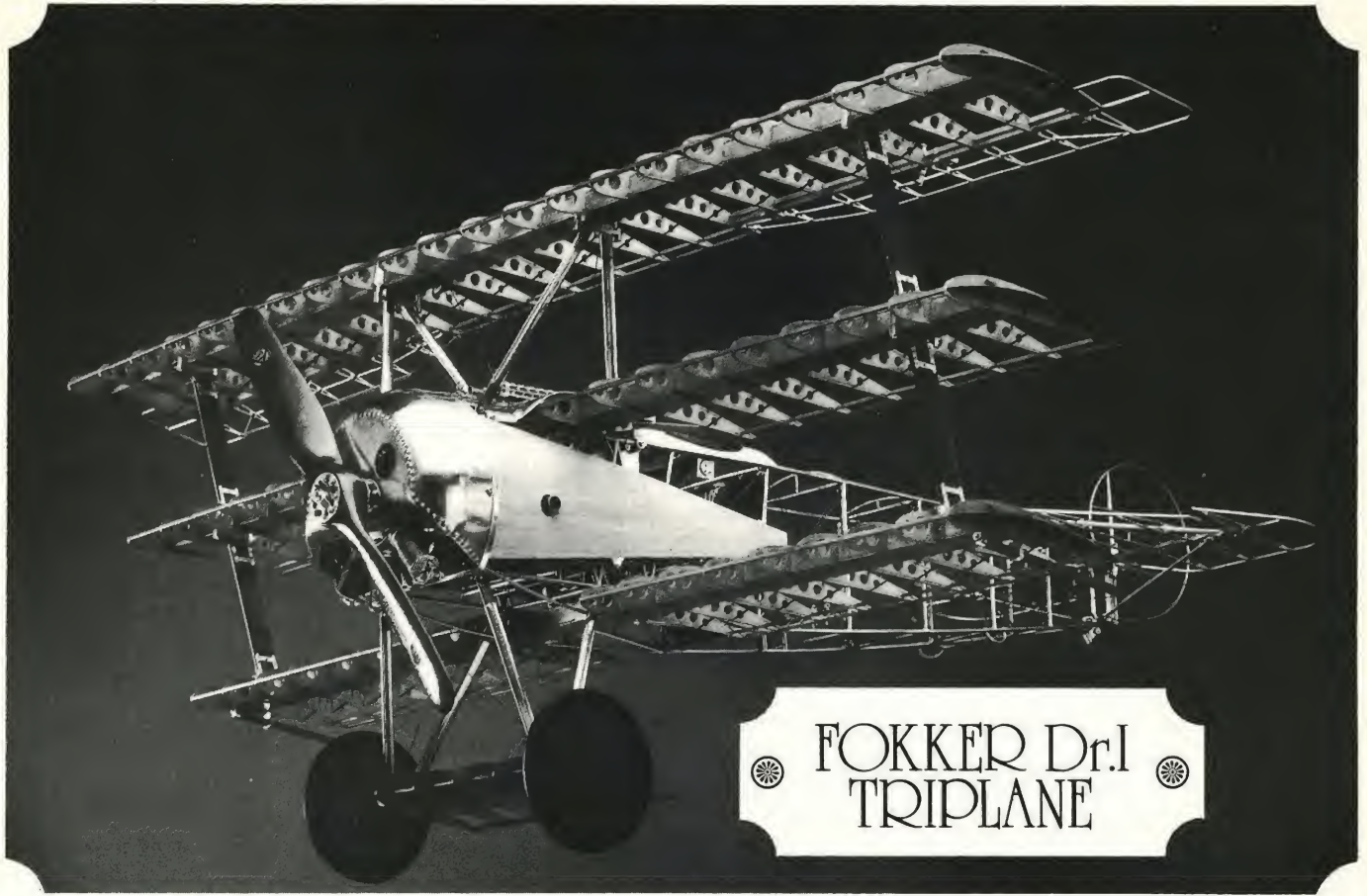
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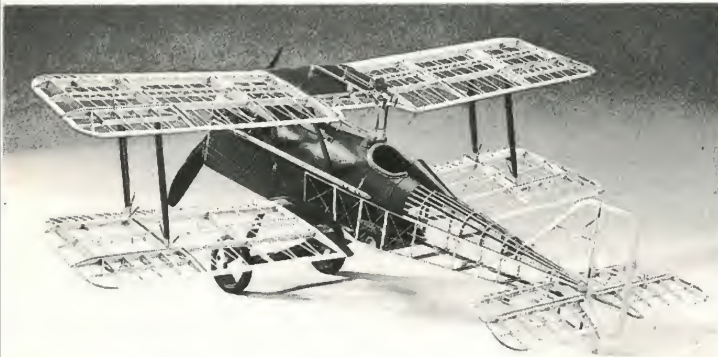
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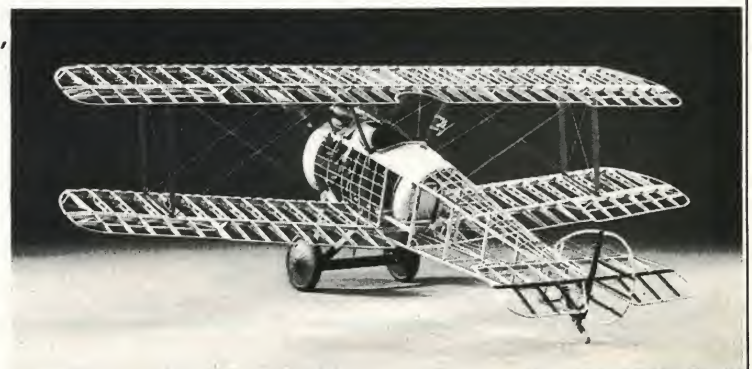
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Kit: No. 584, Lockheed SR-71 Blackbird

Scale: 1/48

Manufacturer: The Testor Corporation, 620 Buckbee Street, Rockford, IL 61101

Price: \$15.00.

THE LONG-AWAITED SR-71 from Testor has arrived. The kit contains 73 parts molded in black and clear styrene and contains optional parts to produce the SR-71B. The 5" x 7" decal sheet is excellent and has markings for three aircraft, one in low-visibility finish. The instruction sheet has 13 easily followed steps along with a page of detail photos and directions on converting the model to the CIA's version of the Blackbird, the A-12.

The fuselage consists of 9 pieces: nose pitot tube, top and bottom nose cone, cockpit top, forward fuselage top, rear fuselage top, bottom fuselage, and top and bottom tail

cone. This assembly required careful fitting and some filling and sanding. The cockpit is well detailed, but the seats are simple with a seam running down their middles; these seams are difficult to eliminate. The canopies have detail on the interior surfaces but the canopy hydraulic struts are too short to hold them open at the proper angle. The corrugated skin of the Blackbird is nicely molded, but I found the raised panel detail a little heavy for the scale. The model is molded with the refueling receptacle open; I wish Testor had provided an optional closed receptacle.

Photos on the instruction sheet show where detail could be added to the landing gear and wheels. Little factual tidbits about the Blackbird are scattered throughout the instruction sheet.

The model scales exactly with the dimensions on the instruction sheet. I used Squadron/Signal's *SR-71 in Action* by Lou Drendel and an article in the May 1979 issue of *Airpower* as references. I painted the model with various Pactra and Testor colors; the box top and photos in the references helped me achieve the multi-toned effect. The finished model is big: 26½" long with a 14" wingspan.

Although the kit doesn't have any tricky assembly procedures, I would recommend it to experienced builders. I spent 30 hours on mine, more than average because the multi-part fuselage required additional attention.

Randal Dieck



Kit: No. 5809, Convair F-106A Delta Dart

Scale: 1/48

Manufacturer: Monogram Models, Inc., Morton Grove, IL 60053

Price: \$6.75.

THE F-106, MAINSTAY of the Aerospace Defense Command and the Air National Guard for over 20 years, now makes its appearance in 1/48 scale. Monogram's kit contains 94 parts molded in light gray and clear styrene. The surface detail is in Monogram's usual fine raised lines and the molded-in detail is outstanding. The main gear wells and the weapons bay contain the best detail that I have seen in a kit in this scale. The instruction sheet's 42 steps name the parts as well as numbering them. Options include open or closed weapons bay, and the early braced or later blown canopies. The impressive five-color decal sheet provides markings for the 87th Fighter Interceptor Squadron commander's aircraft.

Assembly proved to be the difficult part of the project. The cockpit interior is complete and fits well to the fuselage, but the ejection seat prevents the canopy from fitting properly in the closed position. The refueling panel (part No. 41) fits poorly into the fuselage. It is not clear how the nose landing light (No. 83) attaches to the nose gear door.

The lower third of the fuselage and lower half of the wing is one piece (No. 4). This part includes most of the weapons bay interior and is attached to the wing top (No. 3) which includes the main gear well detail. With the addition of gear well bulkheads,



All photos, FINESCALE MODELER: A. L. Schmidt or Paul A. Erler, unless otherwise credited.

missile launch rails, and missile bay door retraction arms, the underside of the kit becomes the busiest area and the most difficult to mask and paint. The instructions show the shock web (No. 58) installed backwards on the forward missile launcher; the shape of it shows how it should fit. The Falcon missiles are molded in two parts; fins are placed in slots that run through the missile bodies. The fit is poor here and requires difficult filling and sanding.

The ram air turbine (No. 38) doesn't fit to its attachment point on the rear fuselage, and installation of the main gear torsion links (Nos. 55) is unclear. The main retraction struts don't fit well. The afterburner assembly prevented a clean fit of the rear portion of the fuselage assembly, so I broke it loose and allowed it to fall inside the fuselage until the fuselage joints had set up. I turned the model on its tail which brought

the afterburner back out and then used a few drops of super glue to attach it.

The intakes presented the worst fit problem of the kit; they required considerable filling and sanding to get them to fair into the wing-fuselage assembly. The blade antenna (No. 56) and temperature sensor (No. 57) fit into holes that are much bigger than necessary. There is no definite location for the navigation light (No. 84). It's nice that Monogram provided both canopies, but the instruction sheet doesn't mention which one should be used with the markings provided in the kit.

The decals are beautiful, but they are thick and don't conform well to curves on the intakes and drop tanks. I'm getting used to the milky adhesive used on contemporary decals, but this sheet had lots of it; the adhesive came off the sheet in large, gooey chunks that refused to dissolve in the water.

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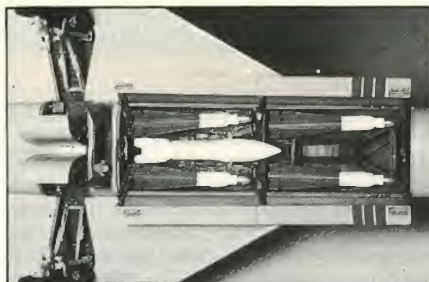
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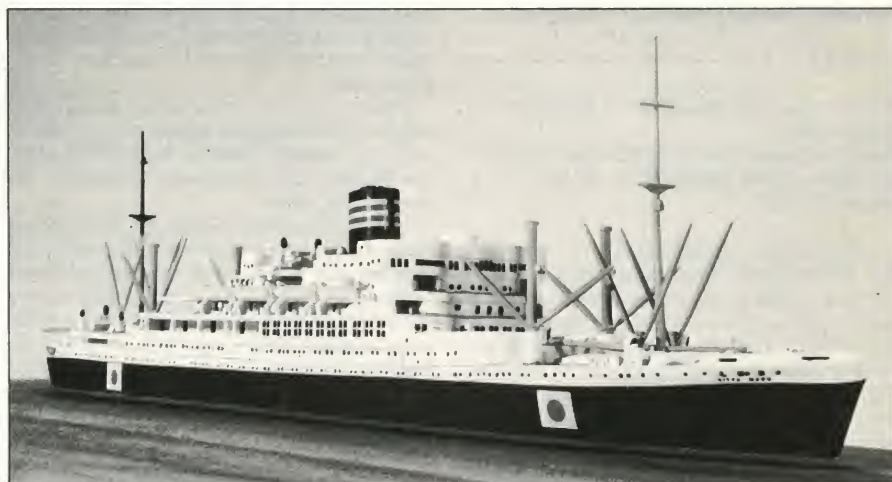
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I painted the model with Testor's Model Master Aircraft Gray (FS 16473) along with Floquil Engine Black and Depot Olive. I spent about 15 hours on the kit, much of that struggling with the fit problems. A modeler who has had some experience with complicated kit construction will be able to handle this one, and despite its problems, the kit builds into a beautiful replica which scales out well with the dimensions given in Bert Kinzey's *F-106 Delta Dart in Detail and Scale*.
Paul Boyer



Kit: No. 96, *Nittamaru*

Scale: 1/700

Manufacturer: Aoshima, distributed by Empire Pacific Ltd., 18027 Clarkdale Ave., Artesia, CA 90701

Price: \$5.98.

A JAPANESE OCEANLINER of World War Two would seem to be an unusual subject for a kit, but the *Nittamaru* and her sister ships *Kasugamaru* and *Yawatamaru* were historically important since they were converted to aircraft carriers in spring 1942. (*Nittamaru* was converted to *Chuyo*, *Yawatamaru* became *Unyo*, and *Kasugamaru* ended up as *Taiyo*.) Aoshima has released kits of all three liners and the carriers they eventually became.

This waterline kit consists of 62 white styrene parts along with a metal weight that gives the model some heft. The detail is nicely executed with raised lines. Like other 1/700 scale ships this one lacks portholes, but they are easily added with a small drill.

I especially liked the needlelike tops to the masts. The instructions are in Japanese, but the exploded-view diagram is easy to follow. The top and side view sketches ease rigging. Decals provide flags, hull insignia, and ship name.

The kit had a number of fit problems, all of them easily solved. I recommend gluing deck parts Nos. 1 and 6 to the hull first, followed by superstructure parts Nos. 7, 8, and 10. Deck part No. 2 will then fit after a little sanding. I had to glue foredeck part No. 1 to the hull in sections since it did not want to lie flat. Aoshima's raised paint division line between the black hull and white superstructure is placed too low. I referred to the box art for the proper division line. The flagstays were too thick so I replaced them with stretched sprue.

A novice ship builder shouldn't have a difficult time building this kit. My model took just 15 hours to complete, which is about average for a ship in this scale.

Dennis Moore

Kit: No. 7490, Custom '83 Firebird S.E.

Scale: 1/16

Manufacturer: Revell, Inc., 4223 Glencoe Avenue, Venice, CA 90291

Price: \$16.00.

THE PONTIAC FIREBIRD has been the hallmark muscle-car for General Motors for the last decade. GM redesigned the Firebird and the Chevrolet Camaro in 1982 with few changes for 1983.

Revell's kit contains 154 pieces molded in black, silver, and clear styrene with rubber tires. It has many operating features: folding seats, pop-up headlights, turning front wheels, and openable doors and hatchback. It is refreshing to see the instruction sheet

name the parts instead of simply numbering them.

According to the dimensions in the dealership book, *Firebird Facts and Figures*, the model measures .3" short, but this isn't noticeable. The model features front fender air extractors which are only available on the Trans Am model of the Firebird. This appears to be a carry-over from Revell's previous issue of the '82 Trans Am. Fairing over the opening with sheet plastic and putty would easily correct the error. The windshield fits flush with the posts on the body shell. I had trouble getting the hood to close completely; the air cleaner touches the underside of the hood, and I had to file the carburetor down to allow the hood to close.



Jamie Hilliker

I spent about 35 hours building the Firebird, which is average for large-scale car kits. There is plenty of room to add more details to the kit, but even out of the box it builds into a fine model. I can recommend it to modelers who have some experience building car kits.

Jamie Hilliker



Paul Boyer

Kit: No. 6427, Mitsubishi A6M5c Zero-sen

Scale: 1/48

Manufacturer: MRC-Tamiya, Model Rectifier Corporation, Edison, NJ 08817

Price: \$9.98.

THE LATE-MODEL ZERO rounds out Tamiya's family of the classic Japanese fighter. The kit contains 68 parts molded in dark green and clear styrene, and the quality of the molding and detail is above average. Options include separate closed and three-piece open canopy and interior flap detail which can be exposed by cutting the flaps free from the wings and installing them in the dropped position.

The instructions are clear and easy to follow with small photos of subassemblies to show painting details. The five-color decal allows seven marking variations and the box art is a useful modeling reference. The fit of the parts is very good; only a little putty was needed where the wing assembly mates the bottom of the fuselage. If the assembly procedure is followed, the model should be painted in the middle of step 5, after the wings and horizontal stabilizers have been attached to the fuselage but before installation of the engine.

The model scales closely to the measurements in R. J. Francillion's *Japanese Aircraft of the Pacific War*. I painted my model with Pactra paints and used the kit decals. The tight-fitting, cleanly molded parts and simple color scheme make this a pleasant project even for beginners. I spent five hours on the model, less than usual for me.

Art Loder

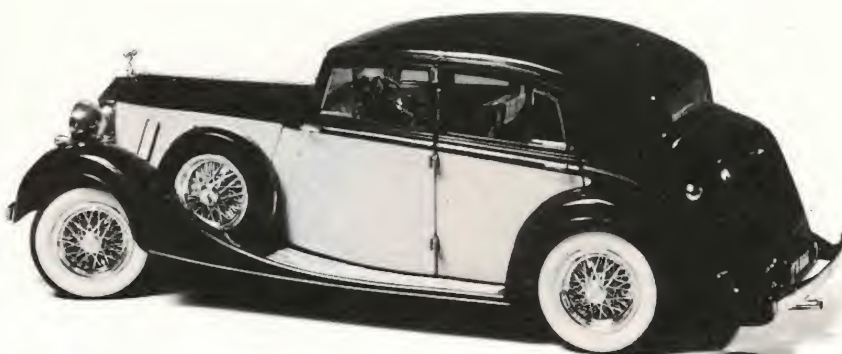
Kit: Lockheed C-141A Starlifter

Scale: 1/72

Manufacturer: Nova Models, Division of Archer's Products, Inc., Archer's Hobby World, 18320 Ward St., Fountain Valley, CA 92708

Price: \$27.00.

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LOCKHEED'S C-141 is a big aircraft, so that makes this one of the largest vacuum-formed kits in existence. It contains 73 vacuum-formed parts molded in .040" white styrene, 25 of which make up the floors and bulkheads. The main and nose gear struts are molded in metal. The quality of the molding is average for a kit of this size. A detailed instruction sheet and Microscale decals are included.

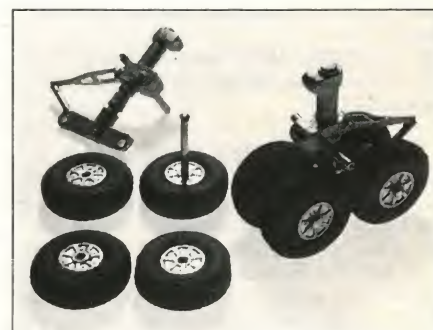
The biggest chore with this kit is cutting out and sanding the parts, and the large pieces present problems when sanding the edges. Since it is difficult to sand the large parts with sandpaper glued to the workbench, I used a 1" bastard file to do most of the work, followed by a grinder on my Dremel tool, then coarse sandpaper. I recommend going slowly at this stage, frequently checking the fit.

The instructions were good until I got to the main gear wells. I wish Nova had provided drawings for this section. I ended up making modifications necessary to support the main gear.

I built the interior of the cockpit according to the instructions, adding lead weights to hold the model down on its nose gear. The instructions suggest removing the cockpit glass area after assembling the fuselage, but I was worried about sawing through the instrument panel and the seats. I cut out the right side before mating the fuselage halves, but wished I hadn't since it then became difficult to align the fuselage halves in that area.

Probably the best way to solve this problem is to cut out this area on both halves before adding the interior. Trim the clear part and dry-fit it to a taped-together fuselage. Keep working on the fit, filing a little at a time until it's right. Then disassemble the fuselage, paint the interior, add the cockpit, and test the fit again. Then, if everything fits perfectly, assemble the fuselage halves.

I also had trouble assembling the wing halves. Although the plastic is hefty, it is



easy to get carried away and sand too far at the edges, leaving thin plastic. Next time I'll reinforce these areas with epoxy. There is no easy way to sand and fit a kit of this size. Just take your time.

I used Testor Model Master white and Aircraft Gray (FS 16473) to paint the model, along with Metalizer Aluminum, Magnesium, and Burnt Metal for the bare metal areas. I used black drafting tape for the walkways and blue drafting tape for the cheat line. The decals include all the standard markings found on the C-141 along with 4 complete sets of numbers to produce just about any serial number. The scale drawings included do not show where the APU (auxiliary power unit) warning arrows are placed. The APU is on the forward end of the main gear sponsons but I guessed at the exact location of the markings.

The C-141 is a complex design and it looks as though Nova's got all the shapes right. The construction would have gone smoother had more details been provided in the instructions and scale drawings, similar to the treatment Nova gave its KC-135 kit. The finished model is 24" long with a wingspan of 26 5/8".

I am not used to putting this much work into a kit. I spent over 100 hours on it and I would recommend this kit only to experienced modelers.

Ray Bareis



Kit: No. P5, McDonnell Douglas F-4J Phantom II

Scale: 1/48

Manufacturer: Hasegawa, imported by Minicraft Models, Inc., 1510 West 228th St., Torrance, CA 90501

Price: \$21.00.

THE FIRST of at least five 1/48 scale Phantom kits from Hasegawa is the U.S. Navy's "J-bird." The kit contains 123 pieces molded in light gray and clear styrene. The detail is mostly fine raised panel lines in the usual Hasegawa style.

The kit includes three drop tanks, four AIM-7 Sparrows, and four AIM-9D Sidewinders. It is easy to see how Hasegawa has planned the production of other Phantom variants; the thin main wheels, alternate rear instrument panel, and short afterburner cans of the F-4B are there along with the early AIM-9B Sidewinder missiles. Subsequent kits will have some of the major sprues replaced by appropriate fuselage, wing, and detail variations.

Fit of the parts was excellent; no putty was needed. This has been a Hasegawa hallmark. The four-piece canopy is clear and distortion-free. The interior is nicely done, but the rear cockpit is not accurate; there are no side consoles in the rear cockpit of Navy Phantoms. The ejection seats could be better detailed, but if the excellent pilot figures are used, they cover up the seats' shortcomings.

The realistic two-part intake splitter makes it easy to paint the fuselage behind it; this has been a problem on previous Phantom kits. Some other nice touches are the molded-open auxiliary air intake doors on the belly of the aircraft, clear gunsight, and the simulation of the catapult hooks.

The eight-step instruction sheet is printed in Japanese and English. There is a section showing the armament capacity of each pylons; alternate weapons are forthcoming in Hasegawa's 1/48 scale weapons set. The decals and application instructions are excellent. The colorful VF-84 "Jolly Rogers" and VMFA-451 "Warlords" markings are accompanied by a full set of stencils and national insignias. A full-color painting guide is included.

The kit scales out well with the dimensions given in Bert Kinzey's *F-4 Phantom II in Detail and Scale, Part III*. I used Floquil railroad colors to paint my model along with Liqu-a-plate for the exhaust area. The finished model is 14½" long with a 9¾" wingspan. I spent about 20 hours on the kit, much of that decaling. The close parts fit may cause minor trouble for the novice but the experienced builder will enjoy it.

Paul Boyer

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Kit: No. 5206, General Dynamics F-16XL
Scamp

Scale: 1/72

Manufacturer: Monogram Models, Inc.,
Morton Grove, IL 60053

Price: \$3.50.

THE F-16XL has not yet entered production but the design promises better load-carrying capability than the conventional F-16A without degrading performance. Monogram is the first company to produce a kit of the Scamp, and only time will tell if the model will be an accurate representation of the production aircraft.

This 34-piece kit is molded in gray styrene with a tinted clear canopy. The kit comes with two underwing tanks, six AMRAAM missiles (Advanced Medium Range Air-to-Air Missile), and two wing tip-mounted AIM-9L Sidewinders. I left off the tanks since I have not seen photos of them mounted on the prototype aircraft. The actual F-16XL will compete against the F-15E Strike Eagle in an upcoming USAF competition for the prime ground attack aircraft, so it is likely to be seen carrying large loads of air-to-ground ordnance.

The detailing is average for Monogram with fine raised panel lines. The interior is well detailed with a nice ejection seat and instrument panel, and the canopy is tinted just right and is free from distortion. The landing gear and doors are nicely detailed and the kit features the latest vertical tail with its characteristic drag chute housing.

I had a few problems with construction. I usually leave off landing gear and underwing stores until the main structure is completed. However, Monogram traps the main undercarriage struts underneath a section of the intake; I ended up chopping the end off of part No. 4 to allow the installation of the gear later on. The intake detail was disappointing; the locator pins and top of the nose gear well are clearly visible. I wish that there were some sort of ducting over this.

The instructions are printed in the familiar symbol language, but are easy to follow. The decals were offset printed so the low-visibility gray insignias were made using a screen of black ink over white. I wasn't satisfied with them so I replaced them with Microscale insignias from sheets Nos. 72-274 and -275. I used Scale Master white stripe decals to outline the blue trim along the top of the fuselage. I used Floquil and Model Master paints for the prototype scheme.

The aircraft looks like a combination of an F-16A nose, intake, and tail attached to a Swedish Saab J35 Draken. I spent about ten hours on the project. The kit can easily be built by a novice; experts may want to wait for the production aircraft to enter service to include any design changes that are likely to appear.

Paul Boyer

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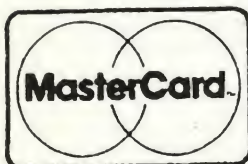
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Weapons sets

Hasegawa, distributed by Minicraft Models, Inc., 1510 West 228th Street, P. O. Box 3577, Torrance, CA 90510, has released four weapons sets in 1/72 scale. Set I covers U. S. bombs and rocket launchers, Set II contains U. S. guided bombs and gun pods, Set III is U. S. air to air missiles, and Set IV is U. S. air to ground missiles. Sets I, II, and III retail for \$4.50, set IV for \$6.00.



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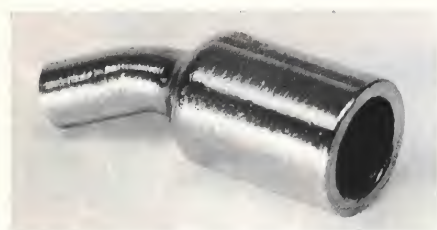
90 mm figures

Series 77 Miniatures, 7861 Alabama Avenue, No. 14, Canoga Park, CA 91304, has released four new figures in its 90 mm cast-metal "Americans" series. They are Peter E. Fifield, Lieutenant, U. S. Army Air Service (No. A/30), \$21.95; Philip O. Stearns, Private, 5th New York Zouaves, 1861 (No. A/31), \$21.95; Brad L. Pruden, Private, Louisiana Tigers, 1861 (No. A/32), \$24.95; and John K. Fyfe, Commander, U. S. Navy, 1945 (No. A/33), \$21.95.



Naval colors

Norseman Model Marine, 518 East Northwest Highway, Mount Prospect, IL 60056, produces Exact-Mix Colors specifically formulated for ship modelers. The fuel-proof enamels will cover wood, metal, fiberglass, or plastic. There are 22 different 6-color sets available in 1-ounce jars (pictured is set 1, U. S. Navy Purple Grays 1942-1953). Each set is priced at \$16.50. Each color is available separately in 1-ounce (\$2.75), 2-ounce (\$3.75), 4-ounce (\$5.75), and 8-ounce (\$8.75) containers. Add 5 percent to all orders to cover shipping and handling.



Airbrush coupler

Binks Manufacturing Company, 9201 West Belmont Avenue, Franklin Park, IL 60131, offers an adapter that allows use of Binks Wren airbrush color bottles on the Binks Raven double-action airbrush. The adapter, No. 59-184, sells for \$2.50.



Weathering pastels

Imported Specialties, 3655 Sullivant Avenue, Columbus, OH 43228, has a pastel weathering set (No. 150) consisting of six earth tone colors. The pastels can be applied with a brush or artist's blending stump and are easily removed with water. The set can be purchased direct from Imported Specialties for \$8.50 including postage.



Paint-on Zimmerit

Nibelung Works, P. O. Box 3496, Arlington, TX 76010, produces Zimmerit Paste which can be brushed on armor models. The paste, along with its own thinner, comes in 1-ounce bottles and the set sells for \$5.50.

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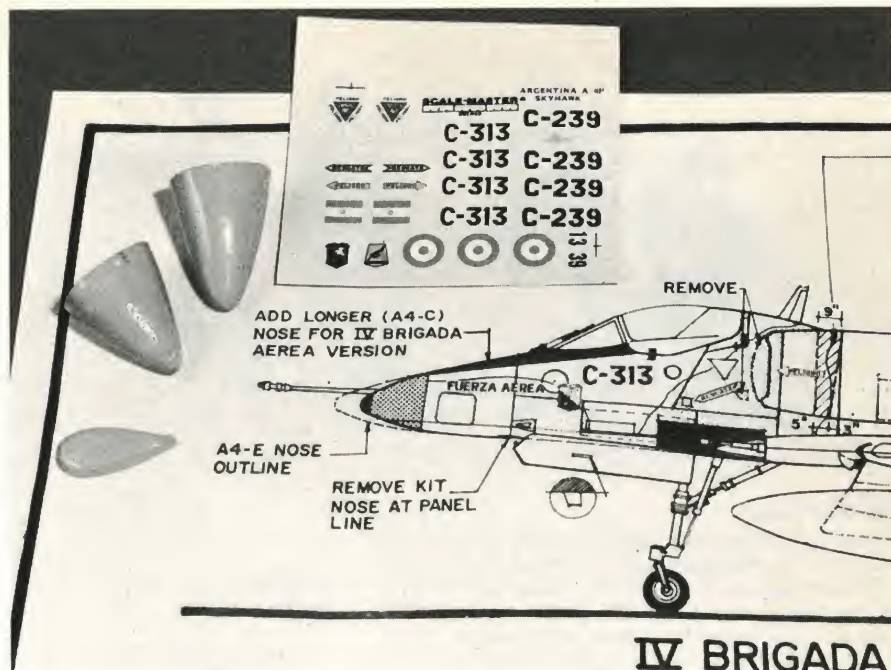
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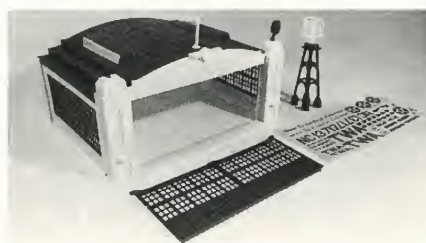
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Argentine Skyhawk conversions

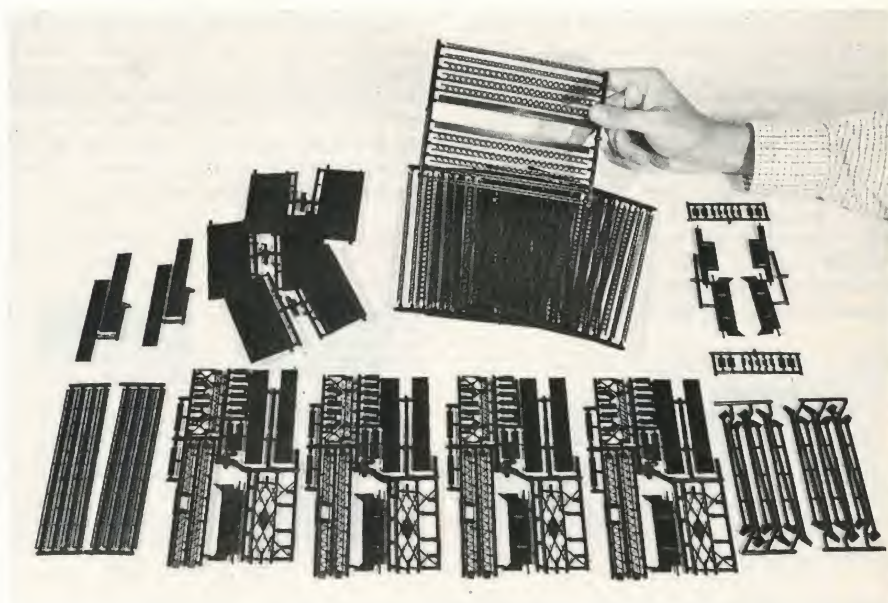
Injection-molded conversion noses for 1/48 scale A-4 Skyhawks in Argentine service are available from Flight Forms, 7415 N. W. 75th Street, Tamarac, FL 33321. In-

cluded in the kit are nose cones for a V Brigada Aerea A-4B and IV Brigada Aerea A-4C, avionics fairing, decals for both aircraft, and instructions. The conversion set costs \$5.50.



Hangar kit

ATP Incorporated, P. O. Box 2891, South San Francisco, CA 94083, distributes the Airliners America kit of a small, single bay hangar. This is the old K-line kit familiar to many model railroaders and is compatible with small 1/144 or 1/200 scale aircraft models. The finished hangar measures 8½" wide, 6½" deep, and 4½" high. The kit includes TWA decals and sells for \$5.00.



Pratt truss bridge kit

Central Valley, 13000 Saticoy Street, North Hollywood, CA 91605, makes an HO scale Pratt truss railroad bridge kit (No. 1902) priced at \$29.95. The styrene bridge

measures 21" x 3" x 4½" completed. The girders, crossbeams, and support members should be useful in dioramas where detailed structures are included, such as hangar interiors.



FROM THE EDITOR

Six issues per year!

EVER SINCE THE TEST ISSUE of FINESCALE MODELER appeared in January 1982, readers have urged that we publish FSM more frequently. Now, after 5 quarterly issues, I'm pleased to announce that FSM will come to you bimonthly, 6 times a year.

A few readers have written in to caution against increasing the frequency, because they felt doing so would mean decreasing the quality of FSM. Not at all. Although our feature article files are far from "bulging," I have quality material on hand to fill those 6 issues per year, and more excellent articles on the way. In fact, I'm frustrated that I can't share *all* those top-notch articles with you immediately — in one huge issue! (We'll have to build up the article stockpile considerably before we can think about going monthly, so if you're working on an article for FSM, finish it up and send it in.)

Do we plan to change anything? Well, purely as a result of publishing more often we can now include more notices of coming events in our "FSM Update" column, and depending on how many notices we receive, coming events may become a separate department. Also planned is a new column, "FSM Questions and Answers," intended to help solve your specific modeling problems. Watch for its debut later this year (and send in your questions!). All in all, though, the basic approach of FSM will remain unchanged: To help you increase your enjoyment of modeling by showing you new techniques and bringing you news of new products and materials.

I'm excited about the future of FINESCALE MODELER, and I hope you are, too, because FSM is *your* magazine. As always, I want to hear what you want to see in future issues of FSM, and I do read and answer every letter. Let me hear from you soon.

Bob Haydel

Editor

FineScale
MODELER

NEXT ISSUE

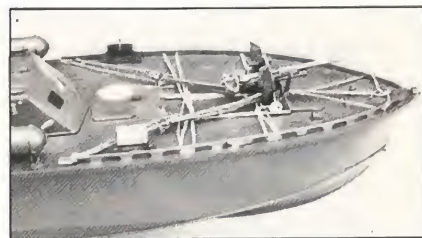
FEATURES



Applying multi-toned metallic finishes. Roscoe Creed.

The March/April issue of FINESCALE MODELER focuses in on painting and finishing techniques. In "Old silver is solid gold," Roscoe Creed explains how he applies multi-toned metallic finishes. Among the materials he uses are Floquil paint and Ultra Brite toothpaste! Accomplished figure painters Bob Knee, Larry Munné, and Bill Ottinger join forces to dispel the mystery of "Painting your first figure in oils." You'll also learn how to construct a paint spray booth, and discover several useful techniques for detailing with paint!

DATA/DRAWINGS

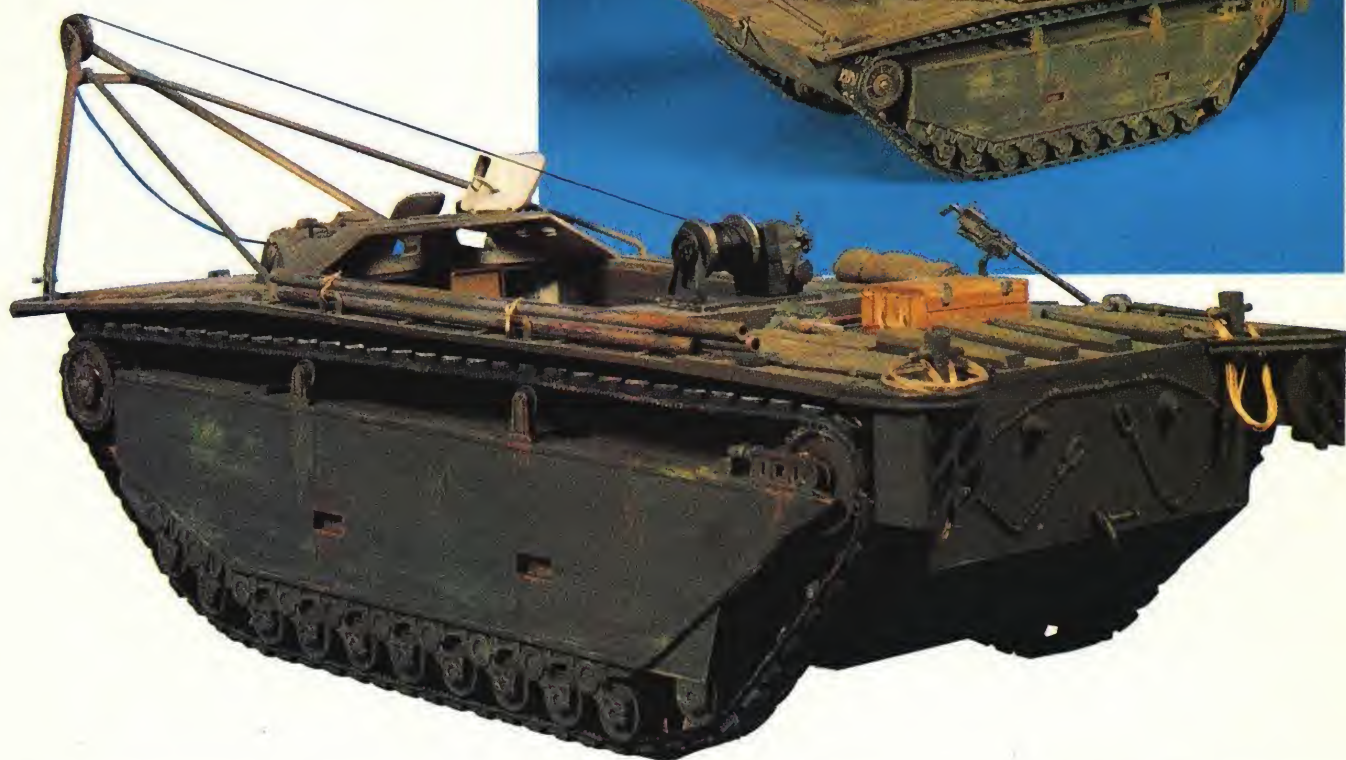


The PT-109 in 1/32 scale. Gifford Hamilton.

The next FSM will feature photos and scale plans of John Kennedy's famous PT-109. This information accompanies a detailed construction article on reworking the Lindberg PT boat kit into an accurate 1/32 scale replica that depicts the craft on the night it was rammed and sunk off the Solomon Islands.

**ALL IN
MARCH/
APRIL
FSM!**

It's nearly impossible to over-weather a model of an amphibious tractor such as the author's LVT because these vehicles frequently saw hard use under the worst possible conditions.



Converting a 1/35 scale LVT(A)5 to an

A few structural changes and lots of details produce a vehicle you won't find on the hobby shop shelf

BY RICHARD WEHR

DEVELOPED IN THE 1930s and early 1940s specifically for amphibious assaults, LVTs (Landing Vehicle Tracked) were present in every major Allied operation in the Pacific during World War Two from Guadalcanal to Okinawa. Most often used to move troops or cargo from transport ships to the beachhead, LVTs were also employed as amphibious artillery platforms, flame-throwing tanks, ambulances, and recovery vehicles.

Nitto makes a 1/35 scale kit (No. 94-1000) of the LVT(A)5 Alligator, a vehicle that carried the turret and armament of the M8 75 mm howitzer motor carriage. In this article, I'll tell how to convert the Nitto kit into an LVT(R)-X1 recovery vehicle. Only a few structural changes are required, yet this fairly easy project produces an out-of-the-ordinary model.

The hull and tracks. Although the

kit does not include an electric motor, the hull contains several parts that appear to be battery and motor mounts, Fig. 1. These would interfere with the placement of a floor you'll install later, so start the conversion by removing them with a diagonal-cutting pliers. Next, assemble the suspension system, drive wheels, return rollers, and pontoons per the kit instructions.

Hull interior and part No. 25. The hull interior, which is wide open to view on the recovery vehicle, receives a scratchbuilt floor, fore and aft bulkheads, a winch stand, and a driver's bench. Prepare cardboard patterns of the floor and bulkheads, Fig. 2, then make the parts from sheet plastic. The floor should rest on supports 4 scale feet (I'll use scale feet throughout this article) from the top of the hull, the sloping forward bulkhead is 3' back from the front of the hull, and the vertical aft bulkhead is 5' from the rear of the vehicle. The driver's bench is 7' wide by 12" high by 15" deep and is 6' 3"

from the front or bow of the vehicle.

In the unmodified kit, the turret rests in part No. 25, which covers an opening in the top of the hull. With a razor saw, cut through part No. 25 1⁵/₁₆" (actual dimension) from its front at the first angle junction, Fig. 3. Set the smaller portion, which will become the vehicle's cab, aside temporarily and return the larger portion to the kit box; it won't be used.

Those are the only major structural changes to the kit; from this point on you'll be building accessories and adding details to kit or scratchbuilt parts.

Modeling the nonskid floor surface. I simulated the safety tread or diamond tread nonskid floor surface inside the hull with 3M No. 1245 Copper Embossed Tape,* Fig. 4. The tape is self-adhesive, but I applied white glue to

*No. 1245 Copper Embossed Tape is an electrically conductive metal foil tape manufactured primarily for use as radio frequency shielding. Contact Industrial Electrical Products Division, 3M, St. Paul, MN 55101, for addresses of distributors.

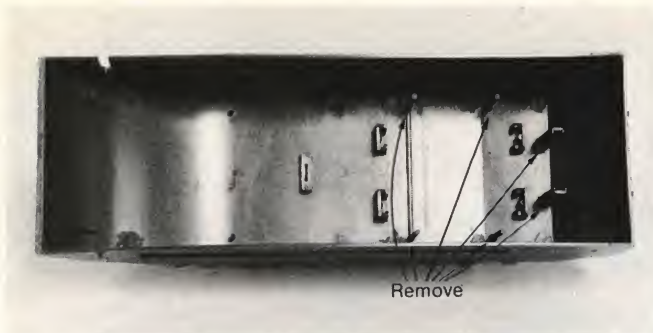
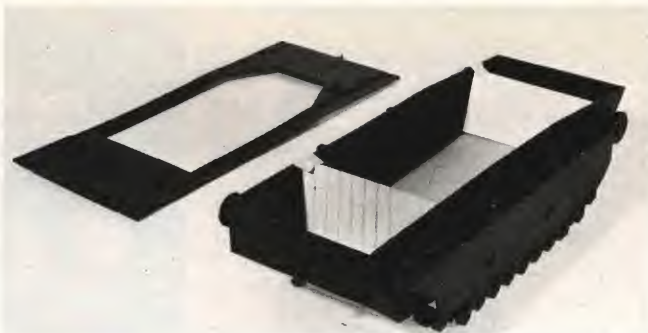


Fig. 4. Richard simulated the diamond-shaped safety tread surface of the floor with an embossed metal tape.



Three photos, FINESCALE MODELER: Paul A. Erler

(Top left) Fig. 1. Because they would interfere with placement of the floor, remove these parts from the inside of the hull. (Above) Fig. 2. Prepare cardboard patterns for the floor and fore and aft bulkheads, then make the floor and bulkheads from sheet plastic. (Below) Fig. 3. Using a razor saw, cut part No. 25 as shown here. The smaller portion will become the LVT's cab; the larger portion is not used.



LVT(R)-X1 recovery vehicle

provide an even stronger bond to the plastic floor. Similar nonskid surfaces are found on truck steps, bumpers on wreckers, and tank floors, so I use the 3M tape frequently in my modeling.

Detailing the aft bulkhead. The aft bulkhead gets a door and an electrical conduit box, Fig 5. The door is 18" wide by 45" high with rounded corners and has a U-shaped handle on its right side. Make the hinges by tightly wrapping .010" No. 30 copper wire (sold in most hardware stores) around a small needle or sewing pin until the coil is 8 scale inches long. Slide the wire off the needle and, using an X-acto knife with a No. 11 blade, cut the wrapped wire into two 4" sections. Using super glue, cement each hinge to the bulkhead, snug against the door edge.

Make the conduit box from a 3" x 6" piece of .060" sheet styrene (or laminate three pieces of .020" plastic). Sand the edges square and drill four .021" holes with a pin vise and No. 75 drill, then insert lengths of .020" No. 24 copper wire into the holes and glue the box and wires to the bulkhead.

Building the winch stand. The winch stand, Fig. 6, is two stacked boxes made from sheet plastic, each

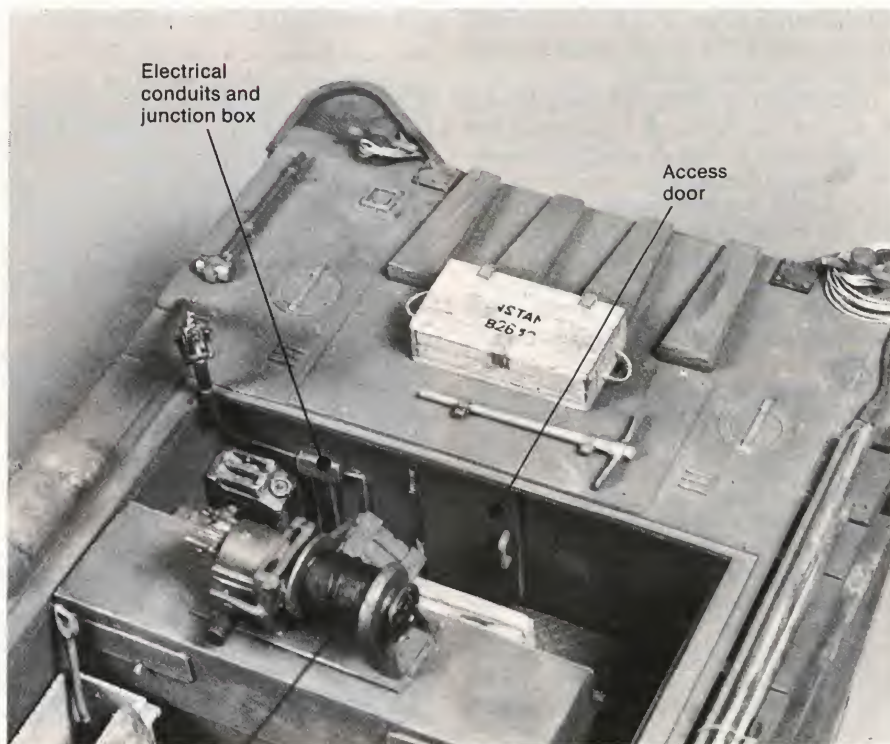


Fig. 5. Aft bulkhead details include an engine compartment access door with copper wire hinges, electrical conduits, and a junction box.

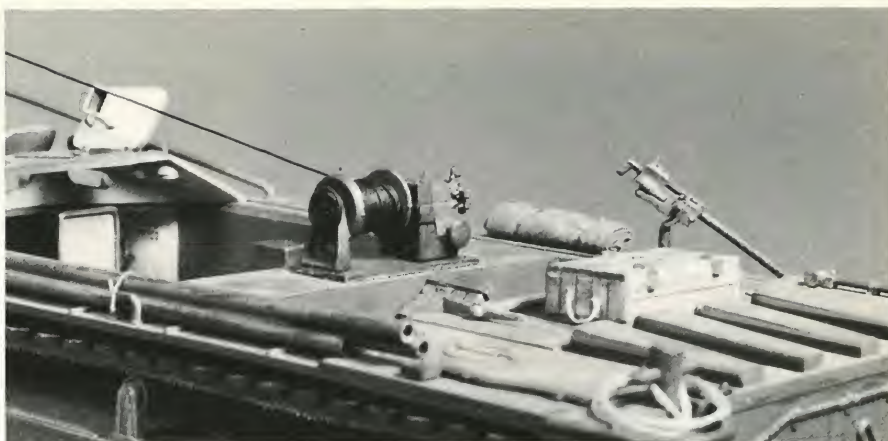
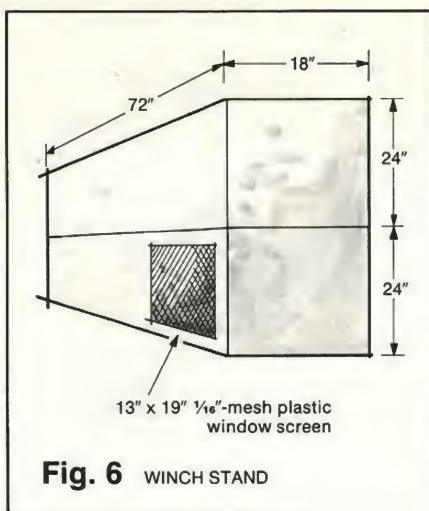


Fig. 7. The winch is from a Revell snap-together wrecker with HO scale model railroad air brake parts added to simulate the transmission and controls.

18" x 24" x 72". Cut a 12" x 18" hole in the lower right corner of the rear side of the lower box and install a 13" x 19" piece of $\frac{1}{16}$ "-mesh plastic window screen to simulate a wire mesh cover. Glue both boxes together and add two 6" x 15" doors to the front of the upper box. Drill mounting holes and attach door handles made from Grandt Line O scale eyebolt lift rings (No. 1108), which are sold in the model railroad section of your hobby shop.

Building the winch. I used the winch from the Revell 1/25 scale Captain Hook Wrecker snap-together kit (No. 6408), added various brass HO scale Cal-Scale freight car air brake parts (No. 313), and mounted the whole system on a plate, which in turn mounts on the winch stand, Fig. 7. Do the same or scratchbuild a winch from wooden dowels and sheet plastic.

Detailing the driver's bench. Install two 10" x 36" doors on the rear of the driver's bench, Fig. 8, and add copper wire hinges and eyebolt handles as before. Build the seat frames from .035" No. 19 brass wire and make the seat adjusting guides from .065" brass tubing. On my model the seat cushions and backs are pieces of business cards painted light tan and glued to the frames.

The steering and braking levers are 1/35 scale bayonets inserted into .060" aluminum tubing until only the handles protrude; the foot pedals on the forward bulkhead are small pieces of plastic mounted at an angle to stand up and away from the floorboard.

Dials and instruments. I often make instrument panels by arranging instruments from decals on a larger sheet, photographing this sheet, reducing the image to 1/35 scale, and printing the photo on medium or double weight photographic paper. I then cut out the panels, tone down their brightness with a light coat of flat paint, and glue the panels to plastic boxes or di-

rectly to the hull. When appropriate, I drill a $\frac{1}{64}$ " hole into the box, bundle several thin wires, and glue them into the hole and onto the bulkhead.

Superstructure. Install the superstructure, including the cab, and begin to add details to it. Use parts from the kit and your spares box and add a searchlight, radio antennas, shutters, periscope, cleats, and bitts.

Crane and cable. Figure 9 shows how to make the crane from $\frac{1}{8}$ " brass tubing and sheet plastic, using super glue as an adhesive and white glue to simulate welding seams. The pulley is a tank wheel from a Revell M40 Self-Propelled Gun (any similar wheel is suitable). I cut the groove in the pulley by mounting the wheel on a toothpick and rotating the wheel while holding a

razor saw on its center line. I enlarged the groove with a triangular file.

The pulley is held between the ends of the jibs by a piece of $\frac{1}{16}$ " aluminum tubing inserted through holes in the jibs and the axle hole in the wheel. Flare the ends of the tubing to lock it in place.

The cable is .010" braided steel wire (No. 5892) distributed by Cooner Sales Co., Chatsworth, CA 91311. Similar wire in .008" to .027" diameters is sold in hobby shops as control lines for flying model airplanes.

Form a loop at the free end of the cable by wrapping a scale 6" length of fine copper wire over a needle, just as you made the hinges. Slide this coil onto the end of the cable, loop the end of the cable through the coil, and lock it in

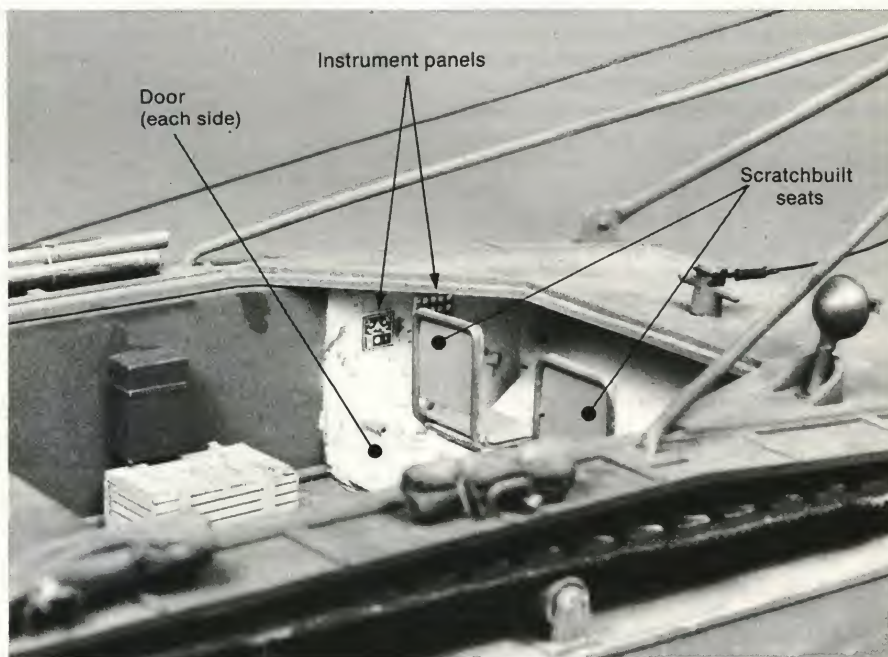


Fig. 8. Mount two doors to the back of the driver's bench, then build the seat frames and guides from brass wire and tubing. Make the seat cushions and backs from thin cardboard painted tan and attached to the frames with white glue.



Fig. 9. The ends of the rear jibs are slightly curved and each end rests on a square plastic plate cemented to the vehicle. Assemble the brass tubing and plastic parts with super glue, then simulate welding seams and beads with white glue. Flatten the lower ends of the forward jibs and pin them between pairs of plastic or metal supports. The pulley is a tank wheel with a V-shaped groove cut into its center line for the braided wire cable. The pulley axle is aluminum tubing.

place with a small drop of super glue.

Painting and weathering. I first airbrushed a coat of Pactra Olive Drab (M6) onto the entire model, then applied successively lighter shades (I add 30 drops of Pactra Primer White [M2] to a jar of Olive Drab), with the upper surfaces receiving the lightest coat to simulate bleaching caused by the sun.

I then prepared a thin black wash by mixing 50 to 100 drops of Floquil Engine Black (RR10) to 1 ounce of Floquil Diosol and airbrushed the wash onto the model to accentuate recessed areas.

You may apply small amounts of silver Rub 'n Buff with a Q-tip to represent worn areas on metal parts, especially on sharp edges. Simulate rusted areas by dry-brushing Floquil Rust (RR73) and then mute the rusted areas by dry-brushing with Pactra Olive Drab, Floquil Grimy Black (RR13), and Floquil Roof Brown (RR70).

The driver's compartment was painted light gray with a 50:50 mixture of Pactra Camouflage Gray (M13) and Pactra Primer White. The winch cable was painted Floquil Engine Black, which has the correct oiled-metal look, while the tracks received Floquil Grimy Black and were dry-brushed with Pactra Steel (M15) and Floquil Rust.

Final details. Add tools, fuel drums, jerry cans, wooden crates (these look best if made from basswood finished with Flo-Stain Maple [S124]), brass tubing pipes, rope coils, and blanket rolls. Weather all of these items to the same extent as the vehicle. These final details add even more interest and texture to your model.

Now that your recovery vehicle's complete, you may want to incorporate the model into a diorama showing the

LVT(R)-X1 hard at work on a Pacific beachhead rescuing a disabled tank or truck, but that's a subject for another article!

FSM

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- *Technical Manual TM 9-775, Mark 4 (LVT-4)*, Government Printing Office, Washington, D. C.
- *Landing Vehicles Tracked, AFV 16*, Profile Publications Limited, Windsor, Berkshire, England.



Meet Richard Wehr

Richard Wehr, from East Amherst, New York, is most interested in modeling WWI and II aircraft and WWII armored vehicles. His LVT(R)-X1 won first place in Open-Top Armored Fighting Vehicles 1/48 and Larger at the 1983 IPMS/U. S. A. national convention in Phoenix, Arizona.

Richard's also a prolific author — some 60 of his articles have been published in modeling magazines in the U. S. and England.

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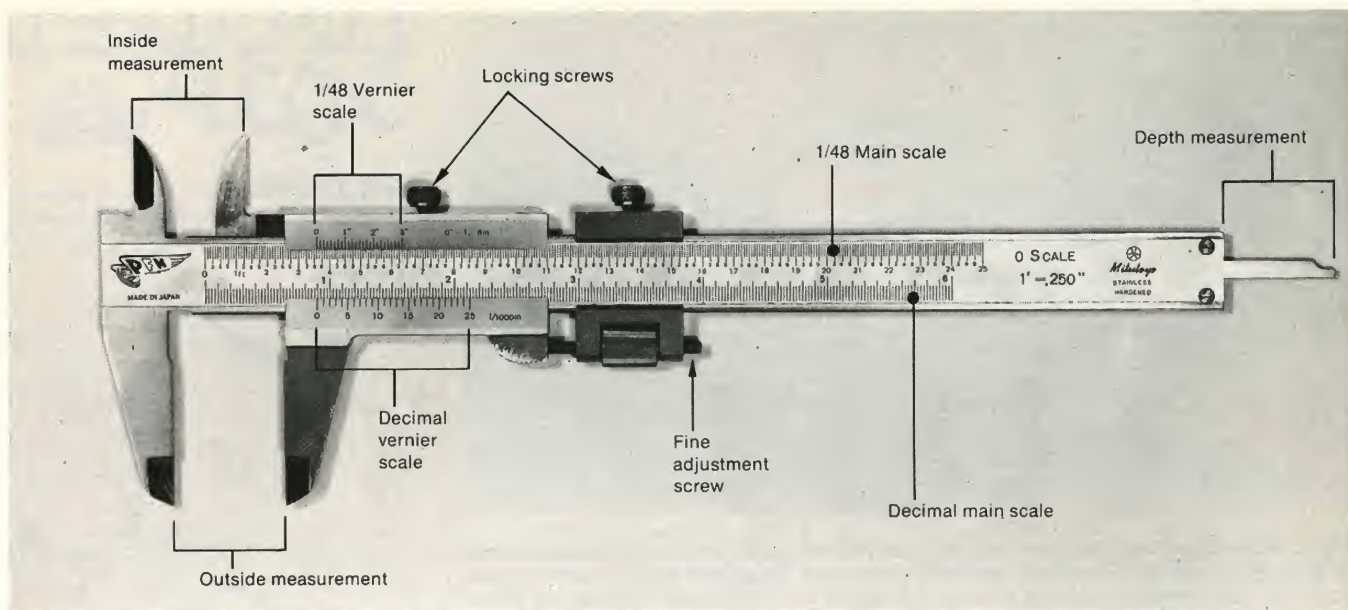


Fig. 1. This stainless steel vernier caliper from Pacific Fast Mail includes both decimal inch and 1/48 scale graduations.

Precision measuring tools for modeling

Calipers and micrometers aren't only for machinists!

BY PAUL BUDZIK

AS SOON AS your tastes in modeling develop beyond building models straight from the box, you'll find that the ability to measure things precisely comes in handy. Whether it's determining the thickness of a sheet of plastic, the diameter of a length of stretched sprue, or measuring off 12' 6½" in 1/144 scale, knowing how to do it is an essential modeling skill.

Precise measuring tools such as calipers and micrometers are necessary because just as we scale down our models, so must we scale down our tolerances of measurement. Despite predictions that metric measurement would become our standard, here in the U. S. the most widely used units are inches and decimal parts of inches. Except where you can obtain a precision measuring tool graduated in the scale in which you are working (I'll mention one in a minute), the best way to measure materials or lay out dimensions on your models is in inches, and tenths, hundredths, and thousandths of inches.

To scale down a full-size dimension, divide it by the scale you are working in. An electronic calculator makes quick work of this. For example, if you are working in 1/48 scale and the wingspan of the airplane you are modeling is 306 inches, divide 306 by 48 to determine

that the model wingspan should be 6.375 inches.

Measuring with a precision caliper.

The most useful measuring tool for modeling is a caliper, Fig. 1. These come in many sizes, styles, and units of measurement. Size is least important; choose a caliper that feels comfortable in your hand, bearing in mind that you probably won't need to open the jaws much more than 2" for most modeling purposes.

One variation among calipers is how the movable jaw moves and locks. Some require that you tighten a screw to lock the slide, while others move only when a release button is depressed. Calipers are also available with a fine screw adjustment to provide extra control for moving the slide small amounts; this doesn't make the caliper more accurate, just easier to use.

Calipers also come with a variety of graduations. The most useful for modelers in the United States are those graduated in decimal inches, but lucky 1/48 scale modelers can purchase a caliper graduated in scale inches and feet.*

Reading a vernier caliper. Figure 2 shows how to make different types of measurements. The most common type of caliper is read by means of a vernier

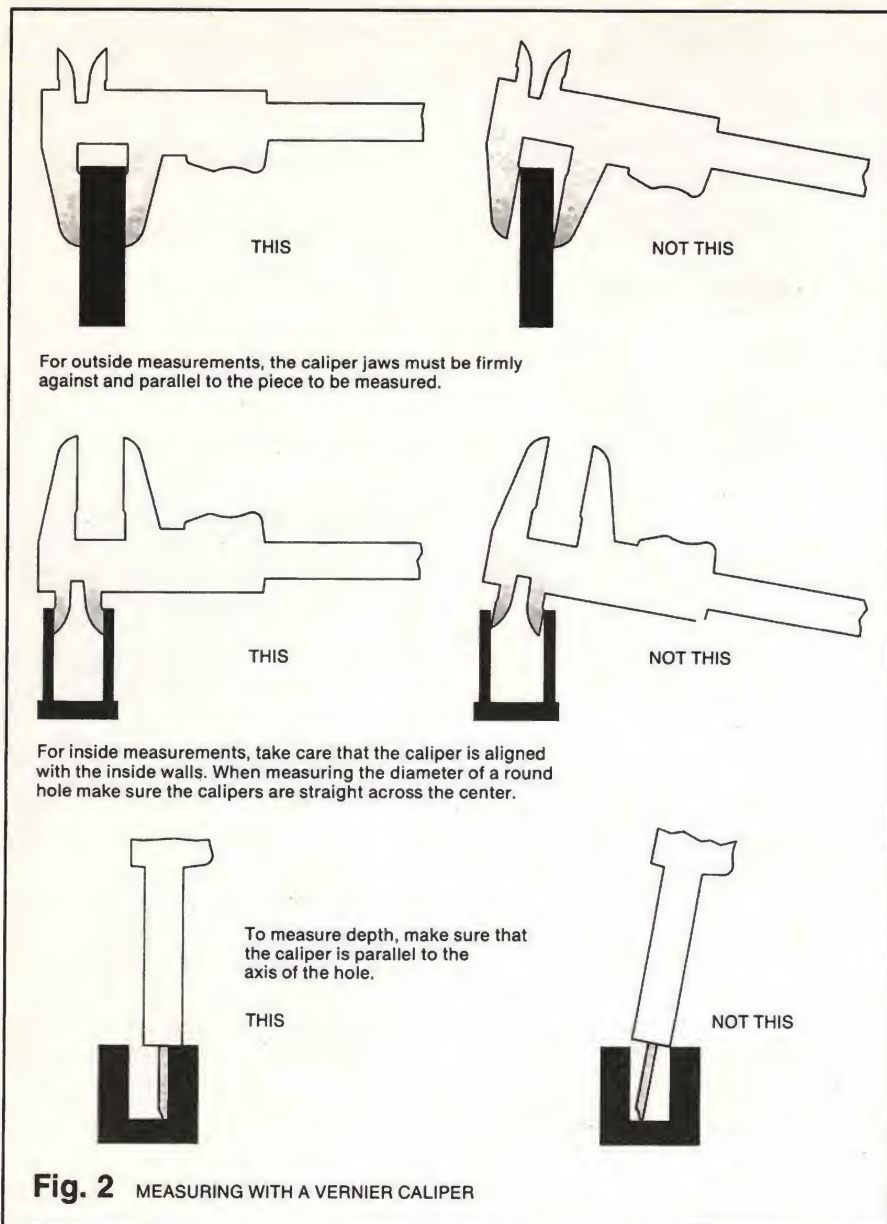
scale. The vernier is the set of marks on the movable slide, that "funny scale that never seems to line up with anything." In fact, the marks on the vernier do line up with something, and their function is to accurately indicate the "in-between" distance when the zero reference mark on the slide does not fall exactly opposite a mark on the main scale.

To read a vernier caliper the first step is to look at the zero mark of the vernier scale. Does it fall exactly opposite a mark on the main scale? If it does then you need go no further; read the measurement directly off the main scale.

When the zero mark on the vernier falls between two marks on the main scale, make a note of the value on the main scale that falls immediately to the left of it. This is your "base" dimension, to which you must add the "in-between" distance. To determine this additional distance, scan the vernier scale until you find a mark that lines up perfectly with a mark on the main scale. Read the number off of the vernier scale and add it to your base dimension to determine the actual measurement.

On a typical decimal inch scale the graduations on the main scale will give you the value to the nearest twenty-five thousandths (.025") of an inch. For example, Fig. 3, if the zero mark on the vernier scale falls just to the right of

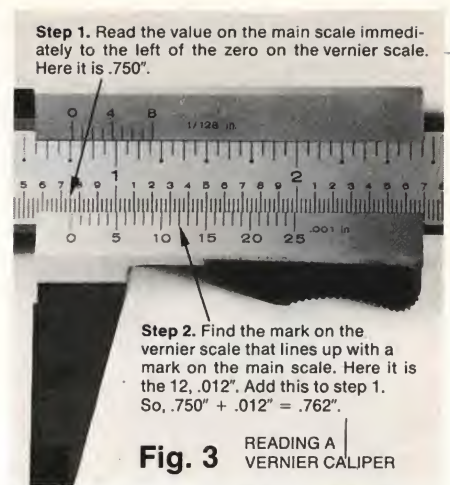
*Pacific Fast Mail, P. O. Box 57, Edmonds, WA 98020, offers a stainless-steel caliper for model railroad O scale, which is 1/48.



the second tick mark after the 7, then your base number is seven tenths of an inch (.700") plus twice .025", or .750".

The vernier scale is for determining the thousandths of an inch (.001") val-

ues to be added to the base number. Look along the vernier scale until you find the mark that lines up precisely with a mark on the main scale. Which mark on the main scale the vernier



lines up with is irrelevant; the measurement is taken from the vernier scale. In the example the number 12 on the vernier falls opposite a mark on the main scale, and the vernier measurement is .012". Add the .012" to the .750" you read off the main scale, and you come up with a total measurement of .762".

Calipers with a dial indicator, Fig. 4, work much the same way; you add the amount shown on the dial to the base measurement on the main scale. Dial calipers are a bit easier to learn to read than the vernier type, but identical in all other respects.

Figure 5 shows a useful modification to a vernier caliper. The tips of the jaws have been sharpened so the caliper can be used for scribing precise lines. One word of caution: If you perform this modification on a grinder be careful to remove material only from the outside portions of the jaws, and work slowly so you do not overheat the tips.

Measurements with a micrometer. While calipers are infinitely more accurate than a ruler, the final word in accuracy is the micrometer. Micrometers take the guesswork out of the in-between measurement, and they come in many sizes. Different styles are required for measuring inside, outside,

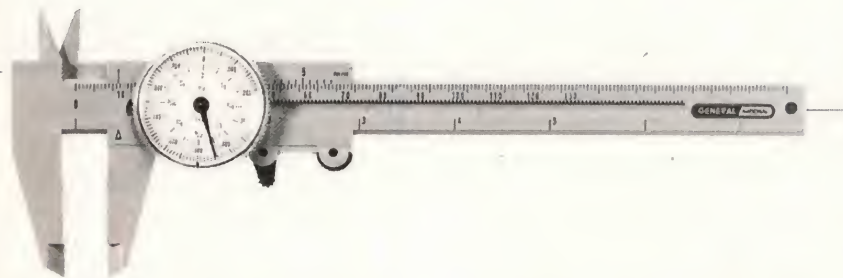


Fig. 4. Made from rigid polypropylene plastic, this General Hardware caliper features both a dial indicator for reading decimal and fractional inches and a conventional vernier scale for metric measurements.



Fig. 5. Sharpening the tips of this caliper turned it into a handy layout tool for scribing lines on plastic or metal.

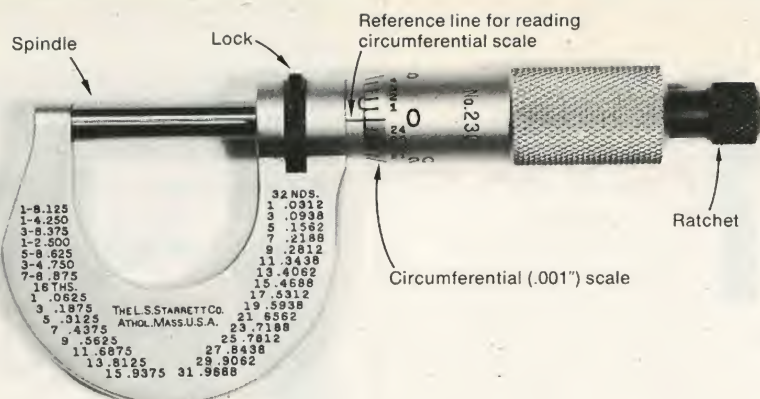


Fig. 6. A typical 1" outside-measuring micrometer. The spindle, which contacts the piece being measured, is moved by rotating the knurled portion of the tool.

Fig. 7 READING A MICROMETER

Step 1. Read the value from the main scale. Here it is .125".



Step 2. Read the value on the circumferential scale opposite the reference line. Here it is 17, or .017". Add to step 1. So, .125" + .017" = .142".



Fig. 8. It takes practice to become proficient in using precision measuring tools, but once you develop the required "feel" it becomes second nature.

and depth dimensions; for modeling, a 1" outside micrometer is ideal, Fig. 6.

Micrometers measure by use of a finely threaded shaft that moves the spindle in and out when the barrel is rotated. Measurements are shown on

scales printed on the micrometer barrel and handle. Learning to read a micrometer is easier than reading a vernier caliper.

To read a micrometer you must take numbers from two different scales and add them together just as you did with the vernier caliper. The base number is taken from the scale on the barrel. On a typical micrometer that reads in thousandths, Fig. 7, each rotation of the handle opens or closes the micrometer .025". This is registered on the scale on the barrel, where each mark represents .025".

After noting the base number look at the scale that is printed around the circumference of the barrel. Each mark on this scale represents one thousandth of an inch (.001"). You read the number on the barrel that lines up with the horizontal reference line on the base scale, and add it to the base number. In the example, Fig. 7, you read .125" on the base scale and .017" on the circumferential scale and the total measurement is .142".

Measuring tips. As you develop a feel for using calipers or a micrometer your measurements will become more and more accurate and consistent, Fig. 8. You have to learn how hard to squeeze the calipers or how hard to turn down the micrometer. Some micrometers have a ratchet for tightening; when the ratchet slips you theoretically have the right amount of pressure.

Be careful not to deform what you are trying to measure; it's easy to squeeze a piece of tubing enough to distort it. As you become comfortable with precision measuring instruments you'll find that using them will become second nature — as well it should be if accuracy is one of your goals in modeling!

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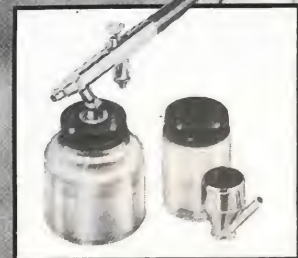


2. Another way to achieve the mottled effect is by free-hand spraying. Set the spray width to fine and hold the air-brush close to the surface using tight, erratic hand motions.

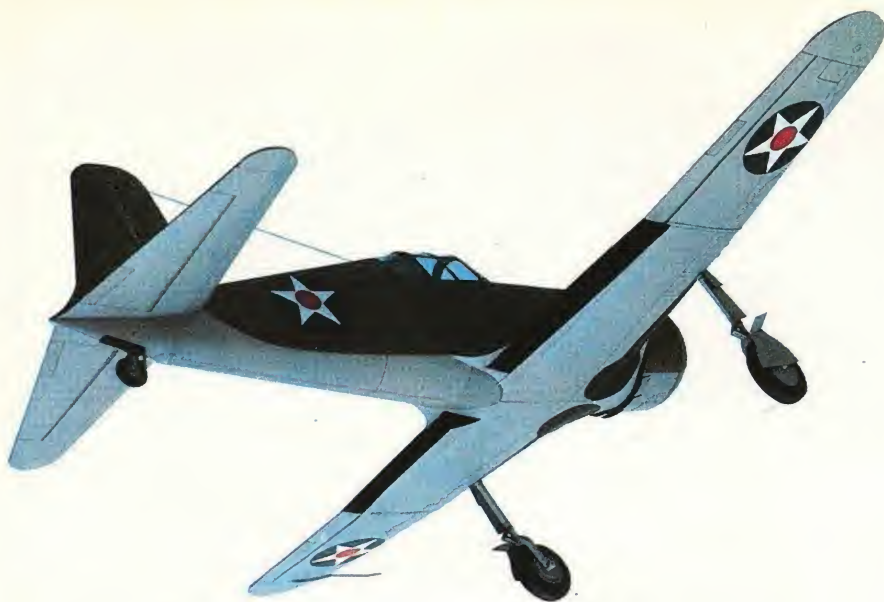
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Building a paper tiger

A card model of the Vultee
P-66 Vanguard in 1/24 scale

BY DOUG EMMONS

THE VULTEE VANGUARD epitomized the classic fighter plane design philosophy of the late 1930s and early 1940s. Poised purposefully on its wide-tracked landing gear, the Van-

guard was a direct descendant of the famous Howard Hughes "Racer" and both craft were attributable to Richard Palmer's design genius. Powered by a 1,200 horsepower, 14-cylinder, twin-row Pratt & Whitney R-1830 radial engine, the Vanguard outperformed most contemporary fighters.

The Vanguard, Army designation P-66, flew faster than 330 mph and was almost as maneuverable as the vaunted Japanese Zero. Some, in fact, mistakenly claimed that the Zero's design was derived from this Vultee product. American pilots reported that the Vanguard was an extremely responsive aircraft with no bad habits. Several pilots who flew both the P-66 and P-40 said that the P-40 was a steadier gun platform, but otherwise no better than the P-66.

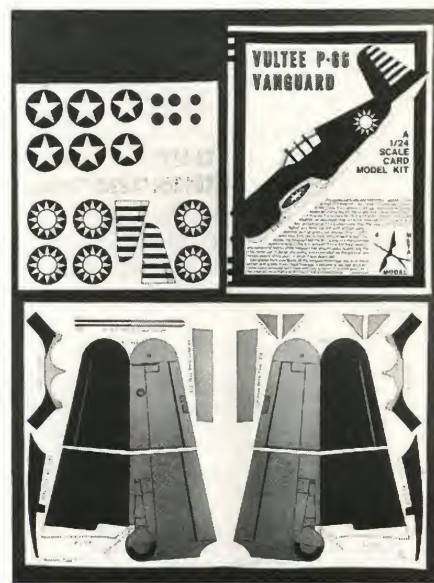
To China and obscurity. Nevertheless, the Vanguard did not fulfill its potential. After limited use by the U. S. Army in 1941-42, most of the planes were assigned to the Nationalist Chinese Air Force. How did this happen?

While Vultee developed the Vanguard in hopes of an order by the U. S. Army, the Swedish government placed the first order for 144 in 1940. Even though an arms embargo against neutral Sweden later resulted in the order being taken over by the plane-hungry British, the U. S. ultimately took delivery of the entire order as the British evidently intended to use the planes only as trainers. The U. S., obligated to support the Nationalist Chinese, saw more potential for these orphaned craft as fighters for Chiang Kai-shek.

After the Japanese attack on Pearl Harbor, the entire West Coast was thrown into an invasion panic and all available aircraft were pressed into service. Pilots from several fighter squadrons were assigned to the Vanguards, which sat on West Coast landing strips awaiting shipment to China. The Army used Vanguards operationally until March 1942 when most were crated to begin their long trek to China



Both of these P-66s were built from Meta Model card kits, using U. S. and Nationalist Chinese markings provided in the kit.



FINESCALE MODELER: Paul A. Erler

The Vultee P-66 Vanguard kit comes printed in color on .008" white cardboard, which cuts easily with an X-acto knife or single-edge razor blade.

by way of Karachi, India (now Pakistan).

What did the Chinese do with their talented warbirds? While most of the Vanguards which reached Karachi had been delivered to Chinese pilots by late 1942, apparently only two squadrons of P-66s were active against Japanese Army forces in 1943. Based near Lake Tungting in Hunan Province, their opposition consisted of Oscars, Tojos, and Lilies of the 25th, 33rd, 85th, and 90th Groups.

Some Vanguards were also flown in combat by American pilots of the 76th Fighter Squadron, 23rd Fighter Group, in 1943 while awaiting their P-40s. Vanguards were reported now and again in the Chungking area into 1944. In the confused political situation in China at the time, much of the lend-lease material sent to the Nationalist Chinese was evidently stockpiled for future use against Mao Tse-tung's Communists. In this maelstrom of war and politics, the potential of the Vultee thoroughbred was never realized.

Building the card model. My firm, Meta Model,* produces a 1/24 scale card model kit of the Vanguard. In this article I'd like to explain several techniques you can use when building this or any other card model kit. As you'll see, you can also use the same methods when scratchbuilding a model from cardboard, plastic, wood, or metal, so mastering card model construction can be a first step toward more advanced projects.

First, let's define a card model. The term "card" is a British coinage refer-

*Meta Model, P. O. Box 221, Batavia, NY 14020. The P-66 kit is \$5.50 including postage.

In this photo and the front-view drawing on page 35, note how part of the main landing gear door hangs at an angle to allow for strut compression while the P-66 is on the ground.



General Dynamics Corporation

The first production Vultee Model 48 in a bare-metal finish with black anti-glare panel appears to carry no markings, though the author believes that this plane or another in the same finish carried Swedish national insignia on wings and fuselage for a short time after September 1941.



General Dynamics Corporation



USAF Museum

One of two Vanguards completed in British markings and camouflage in September 1941. This early production P-66 features an extra window aft of the pilot's seat.



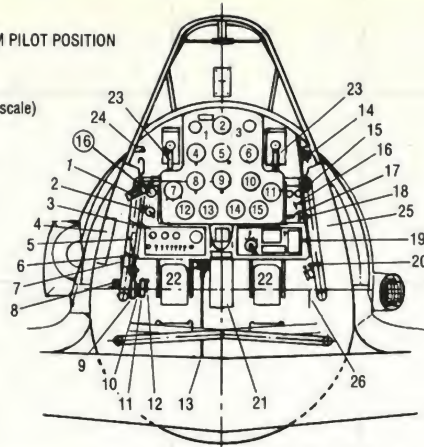
Collection of W. J. Johnson

A factory-fresh P-66 posed in Chinese markings at the Vultee factory in Downey, California, late in 1941.



VIEW FROM PILOT POSITION

COCKPIT DETAIL (1.5x scale)



INSTRUMENT SCHEDULE

- 1 Unidentified
- 2 Radio compass
- 3 Vacuum gauge
- 4 Airspeed
- 5 Artificial horizon
- 6 Vertical speed indicator
- 7 3-function chronograph
- 8 Altimeter
- 9 Directional gyro and slip indicator
- 10 Manifold pressure
- 11 3-in-1 oil pressure, oil temperature, fuel pressure
- 12 Landing gear/Flap position indicator
- 13 Empty
- 14 Tachometer
- 15 Cylinder head temperature
- 16 Hydraulic pressure

COCKPIT CONTROLS

- 1 At station 98 — Carb. heat, outboard; Engine blower, inboard
- 2 At station 108 — Throttle, outboard; Mixture, middle; Propeller, inboard
- 3 Ignition switch
- 4 Electric systems control panel
- 4 At station 125 — Fire extinguisher
- 5 At station 108 — Left wing gun charging handles
- 6 At station 110 — Wing flap hydraulic selector
- 7 At station 110 — Cowl flaps hydraulic selector
- 8 Above and slightly inboard at station 120 — Rudder trim, Oil cooler scoop control crank
- 9 At station 115 — Elevator trim wheel
- 10 At station 115 — Emergency fuel pump handle
- 11 At station 115 — Aileron trim wheel
- 12 At station 115 — Landing gear hydraulic selector
- 13 At station 98 — Fuel selector valve shaft
- 14 Engine primer
- 15 Ventilating system (2)
- 16 Manifold pressure gauge drain valve
- 17 Parking brake
- 18 Vacuum restrictor valve
- 19 Gun control panel
- 20 At station 108 — Right wing gun charging handles
- 21 Optical gunsight
- 22 At station 90 — Rudder pedals
- 23 Gun charging handles
- 24 On each side at station 95 — Cockpit light
- 25 From station 108 through 115 — Radio controls
- 26 At station 122 — Hydraulic emergency hand pump
- At station 128 — Step control wheel

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GUN ACCESS

AMMO STORAGE ACCESS

FUEL

AUXILIARY POWER RECEPTACLE

A (AT ROOT)

RETRACTABLE STEP

STEP

C

TIP SECTION N.A.C.A. .0009-64 MODIFIED

B

N.A.C.A. .0015-64 MODIFIED

A

2 DEGREES

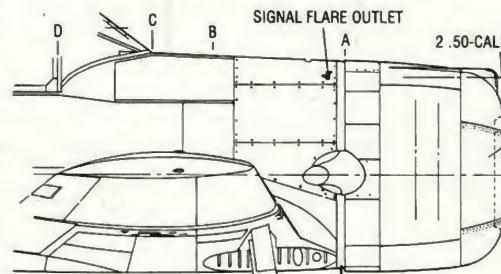
ROOT SECTION N.A.C.A. .0018-64 MODIFIED

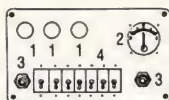
FABRIC-COVERED

SIGNAL FLARE OUTLET

2 .50-CALIBER COLT MACHINE GUNS

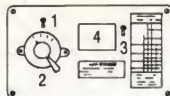
6 SEGMENTS IN COWL NOSE RING





ELECTRICAL PANEL
(4 × scale)

- 1 Rheostats for gunsight, flight instruments, and instrument panel lights
- 2 Ammeter
- 3 Indicator lights
- 4 Toggle switches for battery, pitot heater, starter, oil dilution, running lights, cockpit lights, landing light



GUN CONTROL PANEL
(4 × scale)

- 1 Gun safety switch
- 2 Gun selector switch
- 3 Unidentified
- 4 Unidentified

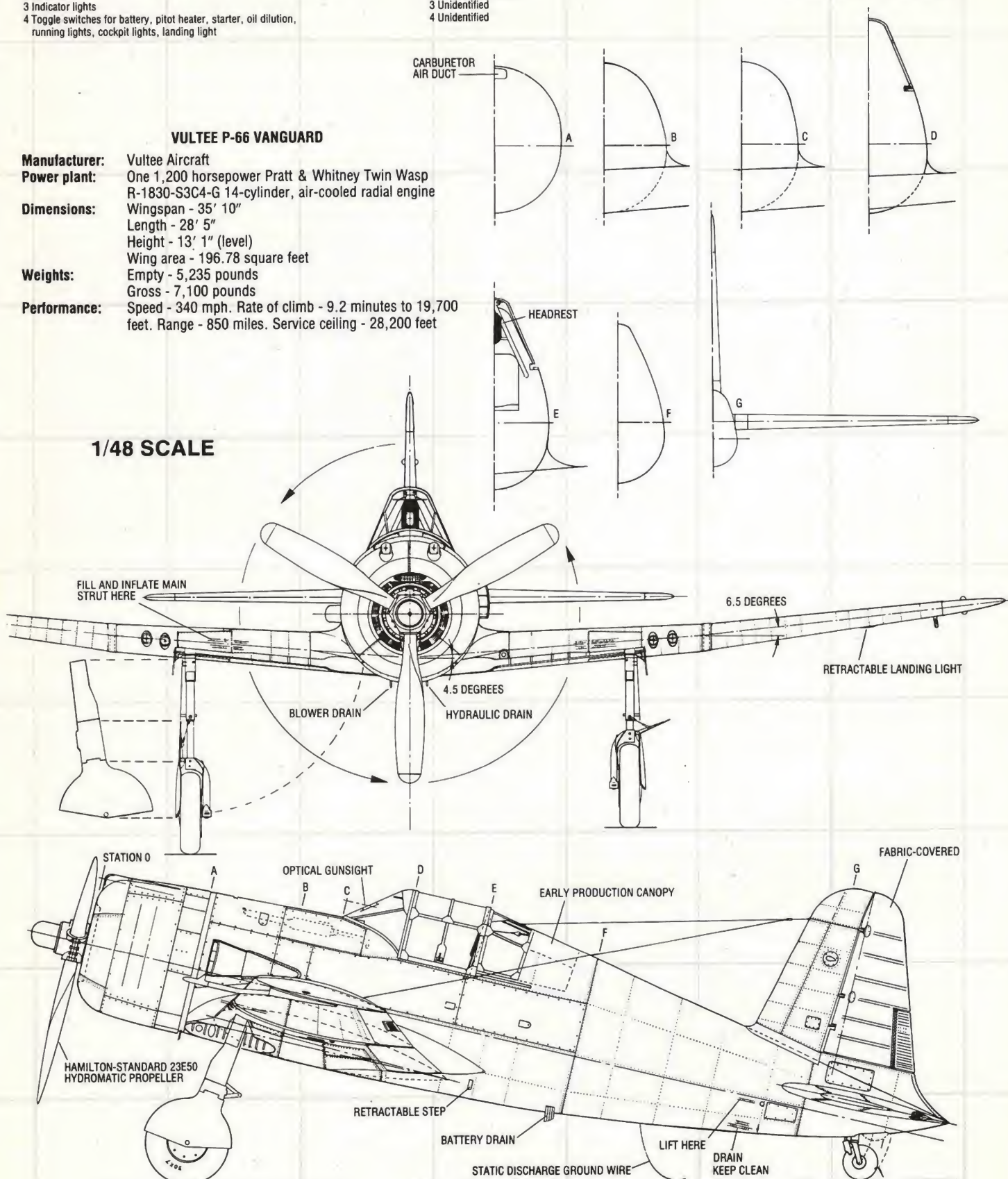
PREPARED FOR
FINESCALE MODELER

BY
Dick Gleason

VULTEE P-66 VANGUARD

- Manufacturer:** Vultee Aircraft
- Power plant:** One 1,200 horsepower Pratt & Whitney Twin Wasp R-1830-S3C4-G 14-cylinder, air-cooled radial engine
- Dimensions:** Wingspan - 35' 10"
Length - 28' 5"
Height - 13' 1" (level)
Wing area - 196.78 square feet
- Weights:** Empty - 5,235 pounds
Gross - 7,100 pounds
- Performance:** Speed - 340 mph. Rate of climb - 9.2 minutes to 19,700 feet. Range - 850 miles. Service ceiling - 28,200 feet

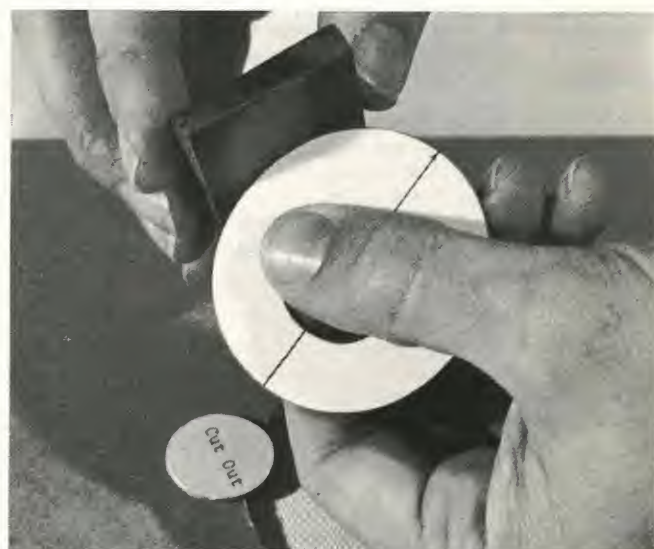
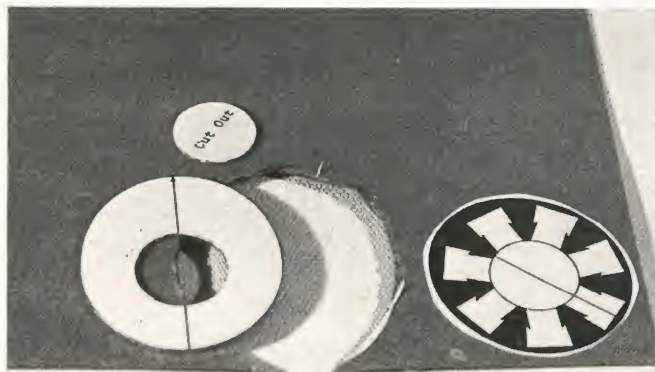
1/48 SCALE





(Left) Fig. 1. Shape the large cowl ring into a cylinder by rolling its inner surface with a dowel on a soft rubber pad. (Center) Fig. 2. Paint the edges of parts that will be exposed on the com-

pleted model with artist's acrylics. (Right) Fig. 3. The straight tab joins the ends of the cylinder; the circular tab provides an attaching surface for the first small cowl ring.



(Above) Fig. 4. Reinforce all bulkheads with scrap cardboard about $\frac{1}{32}$ " thick, such as that from the backs of writing pads. (Right) Fig. 5. Test fit all parts before gluing and sand the edges of bulkheads until they fit easily.

ring to heavy paper similar to that used for postcards. A card model kit consists of one or more sheets of heavy paper with parts printed in color. One way to envision the kit is to imagine a large decal sheet which needn't be applied to a model, but which is simply folded up to *become* the model!

The skeptical modeler might ask if the model must ignore all the curves found in the real aircraft and thus set-

tle for a series of straight lines which only represent complex shapes. No, not if the designer has done his job in hiding the straight lines and the modeler takes advantage of the fact that card stock can be formed into simple and compound curves.

The P-66 Vanguard kit comes in magazine format and includes a photo essay on the aircraft as well as a set of gummed paper U. S. and Chinese in-

signia and numbers. The only other materials required are a few pieces of wire, several small dowels, clear acetate for the canopy windows, white glue, sheets of cardboard about $\frac{1}{32}$ " thick for reinforcements, and acrylic paints to touch up the exposed edges of paper parts.

Typical construction sequence. Let's assemble the engine cowl to illustrate card modeling techniques. The same procedures are used when assembling most of the other parts and are illustrated with the instructions. Note that there are two sets of cowl parts; you can practice by assembling one cowl, then if you're not satisfied with it, build the other.

The cowl consists of flat paper parts rolled into cylinders and sections of cones. These cylinders and cones are held in shape by other paper parts glued onto thin cardboard and cut out to form bulkheads. This is the basic structural technique for the entire kit.

First, cut out each of the three cowl rings (C1, C2, and C3) using a sharp X-acto knife or single-edge razor blade. Guide the knife with a cork-backed metal straightedge. The cutting surface can be a piece of glass or any other material that resists cutting. Make most cuts with a knife or razor blade

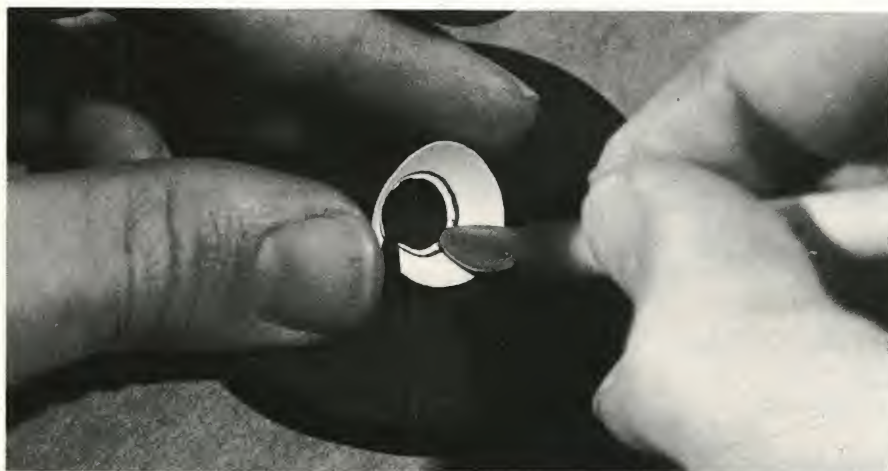


Fig. 6. Use a burnisher or small spoon to work curves into the engine block parts and small cowl rings. Metal and plastic parts can also be curved using this technique.



(Top) Fig. 7. The first small cowl ring fits onto the serrated tab on the front of the cowl, ensuring a strong joint. (Center) Fig. 8. Install the second small cowl ring after gluing the engine block in place. (Above) Fig. 9. The completed cowl structure. Assemble the rest of the fuselage, the tail, and the wings using the same techniques as on the cowl.

because scissors cause the edges of cut parts to curl.

Shape each cowl ring to a cylinder by placing each part on a soft, flat rubber pad and rolling a small dowel over its inner surface, just as if you were rolling pastry dough, Fig. 1. The rolling motion of the dowel will cause the paper to curve smoothly, eventually forming a cylinder. Roll smaller parts on your fingertip. If you work carefully, there's no danger of creasing the parts.

The ends of each ring will be attached to one another with small tabs (C1a, C2a, and C3a). Cut and shape these tabs the same way as the rings.

Continue rolling the rings and tabs with the dowel until each retains the proper curvature without being held. You can use this same rolling technique when making thin sheet plastic or metal parts.

Painting exposed edges and assembly. In order to eliminate thin white lines at joints, paint the edges of all parts that will be exposed on the completed model, using olive drab or gray to match the surrounding areas, Fig. 2. If you want to emphasize a panel separation line, paint the edges black. I use artist's flat acrylic paints because they can be thinned with water and are fast-drying. Don't use marker pens because their inks will soak too far into the cut edge, spoiling the printed colors.

I use white glue such as Elmer's Glue-All almost exclusively when assembling card models. White glue has sufficient tack to help hold parts in place while the glue dries, provides at least a minute's working time, and dries clear, so that the colors of glued parts can show through. I even use white glue as a seam filler.

Because white glue is water-based, if you use large quantities it can soak into the paper, causing warps. For this reason, apply the glue sparingly with the tip of a pin or toothpick.

Now apply a little white glue to one end of each tab and glue it to one end of its cowl ring. After the glue dries, glue the other end of each tab in place, Fig. 3. Next, glue tab C1b into the front (small) end of C1.

Adding bulkheads. Cut out the plain white bulkhead CII and open the hole in its center, Fig. 4. Leave a little excess paper along the outer circumference. Reinforce CII by gluing a sheet of cardboard about $\frac{1}{32}$ " thick to its back. Some modelers make these reinforcements from sheet balsa or basswood, but cardboard works perfectly well. To prevent warps, apply white glue sparingly or use a spray cement such as 3M's Spra-Ment.

When dry, trim the outer edges of CII almost to the line, then shift to a sanding block with No. 240 finishing paper and sand the edges until CII fits easily into the cowl cylinder, Fig. 5. Too tight a fit distorts the joint and makes the completed model look lumpy. Glue CII inside the cowl cylinder, locating it behind tab C1b. Trial fit, then glue bulkhead C1, which has the engine cylinder outlines printed on it, to the front of CII. For correct alignment, one engine cylinder must point straight down.

Notice that you've just created what aircraft engineers call a full monocoque structure — the outer skin (in this case the paper) carries all or most of the torsional and bending stresses. You'll later install the remaining fuselage bulkheads in the same way. Observe that each bulkhead has a printed vertical center line to ensure correct alignment.

Each of the seven visible cylinder assemblies is made from parts labeled Engine Cylinders and Engine Cylinder




(Top) Fig. 10. You can make struts and shafts simply by rolling typing paper over a small dowel. (Center) Fig. 11. The propeller shaft is rolled paper; each blade is formed by front and back paper halves glued over a paper tube flattened at the outer end. (Above) Fig. 12. Landing gear detail. The gun ports are paper tubes inserted into the wing.

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MODEL



Meet Doug Emmons

Doug Emmons, 43, has been building models since 1944, when his father bought him a Strombecker wood kit of the B-17. He and his wife Cynthia and children Natasha, Zachary, and Gabriel live in Batavia, New York, where Doug's a schoolteacher and Cynthia's an artist and writer.

In addition to designing card models, Doug's hobbies include building inlaid wooden airplane and ship models and sculpture.

Heads. Cut out these parts and round each with a dowel and the soft rubber pad to a half tube. The edges of each piece should just touch the cylinder outlines printed on C1. Glue the pieces in place.

Compound curves in paper! If you're still skeptical of paper as a modeling material, building the dome-shaped engine block should make you a convert. The engine block is built up of sections of cones which are cut out, rolled, and then formed. After rolling each part with a dowel to form the conical shape, work a compound curve into each part by rubbing its inner surface with a burnisher or small spoon while holding the part on a hard rubber pad, Fig. 6. Do the same later when forming the two cowl rings that go in front of the engine.

This forming technique seldom works the part to the same radius as on the full-size aircraft, but there is sufficient curvature to fool the eye into seeing the same radius — reflected light from even a slightly curved surface is much different from that reflected from a flat surface. This gentle fooling of the eye is perhaps what scale modeling is all about.

Installing the cowl rings. Assemble the engine block disks and the formed parts per the kit instructions, but don't glue the block into place until after you've installed the first cowl ring. The first ring fits on a serrated tab at the front of the large cowl cylinder, Fig. 7. The second ring butts against the front of the first ring, so make sure the parts fit correctly before gluing, Fig. 8. If

necessary cut open the seam and reduce the ring's diameter or increase its diameter by gluing a piece of scrap paper at the seam.

Paint the inside of the cowl rings flat black, then install the carburetor air duct and gun fairings, Fig. 9. You may add the optional cowl flaps later.

The cowl is complete. Set it aside as you assemble the remaining fuselage structures. If you're not happy with the cowl you've just built, build another from the parts provided.

Construction techniques for the rest of the model are simply variations on those you mastered when building the cowl. In the wing and horizontal stabilizer, spars and ribs serve the same functions as the fuselage bulkheads, supporting paper skins that create strong, rigid structures.

Make landing gear struts, propeller shafts, and similar items by rolling typing paper around a small dowel such as the handle of a cotton swab, building up whatever diameters are required, Figs. 10, 11, and 12. Use white glue both as an adhesive and to seal the surface of the paper, priming it for paint. Wrap strips of paper around a wire or wooden mandrel to form tubes for gun barrels and ducts.

Detailing. You can choose whatever level of detailing suits your fancy. At one extreme, you can leave off the landing gear, represent a spinning propeller with a clear plastic disk, and leave the paper in place between the canopy window frames. On the other hand, you can use kit and scratchbuilt parts to superdetail the cockpit interior, build a three-bladed propeller and landing gear, add additional engine details, install wing flaps, and show open panels.

The kit provides gummed paper numerals and insignia to complete the model in U.S. Army or Nationalist Chinese markings or you may choose to apply British or Swedish markings. Finally, you may spray the completed model with several coats of clear polyurethane varnish. Start sanding between coats after the fourth or fifth coat and apply the varnish until the plane's surfaces are absolutely smooth. However, I don't apply varnish to my models and I think they will last just as long as varnished models.

Completed, the Vanguard kit is an accurate scale model resplendent in early WWII colors. Viewers will be amazed that this mean-looking little fighter is but a paper tiger. **FSM**

REFERENCES

- Jones, Lloyd S., *U. S. Fighters*, Aero Publishers, Inc., Fallbrook, California, 1975.
- Mondey, David, *American Aircraft of World War II*, Aerospace Publishing, Ltd., London, 1982.



All photos, FINESCALE MODELER: Paul A. Erler

Dealing with decals

They can be a delight or a disaster

BY PAUL BOYER

MANY MODELERS enjoy decaling their models; others dread it. That's understandable; a fabulous construction and paint job can be spoiled by mediocre decal work. You put all that time and effort into a scratchbuilt model, or a multicolored camouflage job carefully applied with an airbrush, only to reach that point where, it seems, you are at the mercy of the decal manufacturer. Will the decals behave as advertised or will they turn your dream model into a nightmare? Let's shed some light on the dark art of decaling.

What is a decal? The ultimate goal of decaling a model is to make the markings appear as if they had been

painted on the surface with a miniature stencil or mask. It is not practical to provide tiny scale stencils, so decals have their photographically reduced images printed on a clear carrier film.

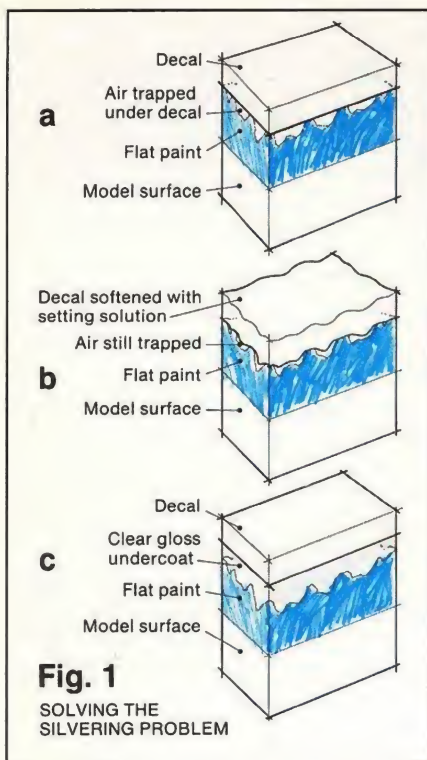
The word decal is an abbreviation of the word decalcomania, which really isn't a psychological condition brought on by buying and using decals. The word means a transfer of an image from one surface to another. While the term also applies to paper and vinyl stickers and dry transfer lettering, most modelers take it to mean the kind of decals that must be soaked in water to release them from their backing. That's how I'll use the term in this article.

Decals can be produced by several methods, but the most common are offset and silk-screen printing (see box,

page 43). The advantage to offset printing is that the full spectrum of colors can be produced using only five colors of ink: white, yellow, red, blue, and black. This is accomplished by printing several layers of tiny colored dots on top of each other. Printing red dots over yellow produces orange, blue over yellow produces green, and so forth. However, for close-up viewing the "spotted" effect of such compound colors is a disadvantage.

Silk-screen printing can produce sharp detail, but each color must be printed on a separate run through the press, and every run adds to the cost of the finished product. If the design includes two similar shades of blue, the manufacturer may compromise and cut costs by printing only one shade for both items.

Silk-screen inks are nearly opaque and can be printed on just about anything. Offset inks are actually translucent; they are made to dye paper surfaces and depend on the paper's opacity for color saturation. The lighter colors, such as white and yellow, may have to be run twice to achieve acceptable



This Airliners America 1/144 scale Fokker F28 was painted white and light gray with silver engine trim. The rest of the markings including the windows, windshield, and wing walkways are Empire Airline decals from ATP.

opacity. Often this "double strike" results in poor register (misaligned images).

Until recently, kit decals provided only the minimum of markings, usually national insignias and serial numbers. The printer used stock inks, often quite different from the actual colors on the original subject. Today, many kit decals are created specifically to give an accurate representation of a specific subject. "After market" decals,

bought separately from kits, offer a wide variety of alternate markings to the modeler who wants more than the kit decals.

Sometimes accurately translating markings from a photo is not enough to produce a good decal. The kit that the decal is intended to complement also has to be considered. The better decals on the market are designed to fit certain kits, allowing for curved, raised, and depressed surfaces. A decal that fits like a glove on one F-16 kit may not fit at all on another F-16 kit, even

though the subject and scale are the same.

Getting decals to stick. Decal paper includes a water-soluble adhesive that attaches the decals to painted surfaces. These decals won't stick to bare plastic, though, so it is important to paint any model that is going to be decaled.

Decals adhere best to smooth, glossy surfaces, and that's a problem. Nowadays, most of us choose flat paints to finish our models. Some paint manufacturers carefully match their colors to specific color standards and produce

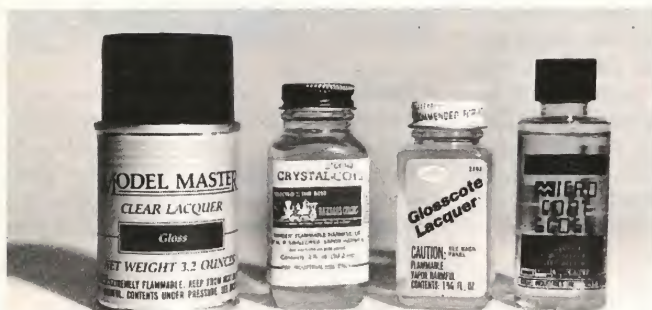


Fig. 3. (Above) Decal setting solutions will work with any decal, but first test them on a spare decal to see if there are any adverse effects.

Fig. 2. (Above left) Gloss undercoats are the key to good decaling. Use brands that are compatible with the paints used on the model.

Fig. 4. (Left) If the model is to have a flat finish, use a clear flat over the decals.

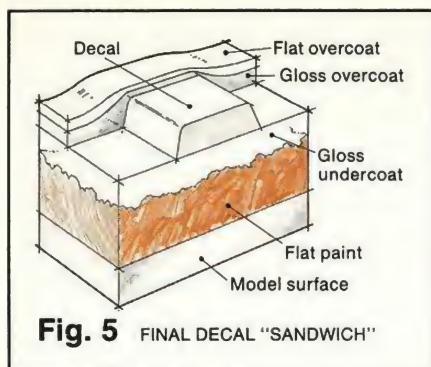


Fig. 5 FINAL DECAL "SANDWICH"

a "scale flat" appearance on the finished model. Now, after all they have done for us, we're going to put on a gloss coat for the decals. Seems like a throwback to the fifties, doesn't it? Actually, flat paints are just fine, as long as you don't put decals on them. Let's take a closer look at the problem.

Why gloss? The reason for applying a gloss coat over flat paints is to eliminate the phenomenon known as "silvering." If we could look at the surface of flat paint with a microscope, we would see a rough, sandpaper-like surface of peaks and valleys. Now, let's put a decal on this surface. Under the microscope, the clear areas of the decal resemble a sheet of glass, Fig. 1a. Silvering is caused by light traveling through the clear film, through the air around the peaks, bouncing off the surface of the paint, back up through the air again, and then through the clear film. When light goes through this much gyration, it scatters and bends, creating a silver or opalescent reflection.

Decal setting solutions begin to solve the problem but are often not enough to eliminate it. Let's watch the effect of a setting solution under our microscope. It begins to dissolve the decal, softening it and allowing it to sag into the valleys of the flat paint surface, Fig. 1b. But there is still some air underneath the decal. Squashing the decal might squeeze the air out, but some air is likely to be sucked back in as the decal bounces back. The problem can only be solved by eliminating the uneven surface.

Some flat paints, especially lacquers that aren't thoroughly dry, can be rubbed out with a cloth. Rubbing out has the effect of scraping off the tops of the peaks and filling in the valleys with the residue. If the paint is allowed to dry completely, it hardens and resists the abrasive action of the cloth.

The best solution is to apply a gloss coat over the flat paint, Fig. 2. Back to the microscope. Now we see that the gloss overcoat has filled in the valleys level with the peaks, Fig. 1c. This eliminates the air problem and pro-

duces a smooth surface that the decal will adhere to.

Decal setting solutions. Glossing the surface takes care of one of the major decaling problems but it won't make the decal conform to the larger peaks and valleys of surface detail. This is where a decal setting solution is necessary, Fig. 3. A decal, especially one that has been printed in many colors, has trouble bending over and into recessed panel lines, control surface hinge lines, air scoops, rivets, and the assorted bumps and pits found on our models.

There are a number of decal setting solutions on the market, but it's a good idea to test any setting solution on a small, unimportant piece of the decal sheet you're going to use (see decal problems and solutions, pages 42 and 45). Microscale's Micro Set acts as a wetting agent; it primes the surface for the placement of the decal, helping to eliminate bubbles while slightly softening the decal. Micro Sol uses a solvent base which gently dissolves the inks and carrier film. Walther's Solva-set and Testor's Decal Set are also solvent-based but are stronger than Micro Sol; they work especially well with the thicker decals found in some kits.

Some decals may need to be cut and prodded to help them fit into the deepest depressions. Once the decal setting solution has been applied, the decal sometimes distorts and becomes extremely fragile. A softened decal can be torn easily if you try to move it, so final positioning should be done with care, and once the decal has been treated with a solution it's best not to move it at all.

Overcoats. The last step is to apply a clear overcoat, Fig. 4. This serves the dual purposes of sealing the decal and providing a consistent finish to the model. The decal is sandwiched between two coats of clear paint, gloss beneath and either gloss or flat above. This helps protect the decal from future battles with the elements, especially for models that won't be displayed in cases.

Some modelers apply a gloss coat over the decals and then a flat coat over that. This helps bury the decal, making the edges of the clear film less noticeable, Fig. 5.

Microscale's so-called "Micro System" is essentially this process, but this system will work with almost any surface, decal, setting solutions, and clear coats.

Solving decal problems. A standard step-by-step decal application sequence is shown in the box on page 44, but it doesn't take into account the many things that can go wrong with decals. Here are the most common problems and ways to prevent or correct them.



• **Silvering.** *Symptom:* Clear area of the decal has a shiny, silver appearance under certain lighting conditions, Fig. 6. *Cause:* Decal is not in contact with the surface of the paint. *Solution:* Use a gloss coat over flat paint and use decal setting solution.



• **Blow-out.** *Symptom:* Small area of decal is distorted and torn, Fig. 7. *Cause:* Concentration of decal setting solution has softened the decal to the point that it fractures. *Solution:* Absorb excess setting solution, dilute, or use weaker setting solution.



• **Stains.** *Symptom:* dry white or reddish-brown blotches often found in corners of model and around decals, Fig. 8. *Cause:* accumulation of setting solutions, decal adhesives, and water-borne minerals. *Solution:* Absorb excess water and setting solutions before they dry. Wipe area with damp cloth or cotton swab before applying overcoat.

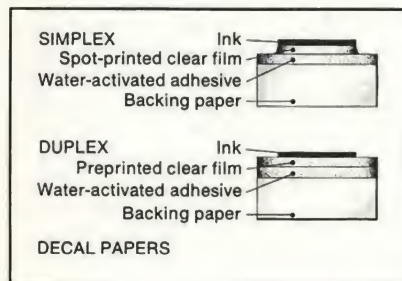


• **Bubbles.** *Symptom:* tiny dome-shaped areas on dried decal, Fig. 9. *Cause:* bubbles of air trapped underneath de-

Text continued on page 45

HOW DECALS ARE MADE

After the subject of the decal has been chosen and researched, the artist produces the images that will eventually become the decal. Today's multi-colored decals are produced by a photographic reduction process. To make it easier to produce tiny details and tight color registrations, the artist produces the original artwork many times larger than the finished decal.



The decal artist must create art which isolates each color from the others. These are called separations and each one has only the images for a single color. A five-color decal will have five separations, plus one more for the clear film if the decal is to be printed on simplex paper (simplex paper has the clear film spot-printed only where there will be an image; duplex paper has a clear film printed over the entire sheet). No matter what colors are on the final decal, all the artwork must be done black on white so that it can be photographed. Registration marks are added to each separation to ensure the colors line up properly.

The next step is to have the separated artwork reduced to the final size of the decal. The images are made into photographic negatives using a graphic arts camera. This is not your average 35 mm camera, but a large piece of equipment which can require the space of a good-sized living room and is capable of reducing artwork down to 20 percent of its original size. The negatives are used to burn a positive image on either a photographic offset plate or a silk screen.

Offset. When the offset plate is "burned," the clear areas of the negative allow light through to harden the image on the plate's emulsion. The plate is developed and all the non-image areas are washed away. The plate is designed so that the image areas will retain ink, and the non-image areas repel ink. The plate is then placed on the press and small rollers lay a thin film of ink and water on the plate. The water helps keep the non-image areas clean. The image is printed onto a rubber "blanket" on the offset cylinder which in turn prints the image onto the paper passing through the press.

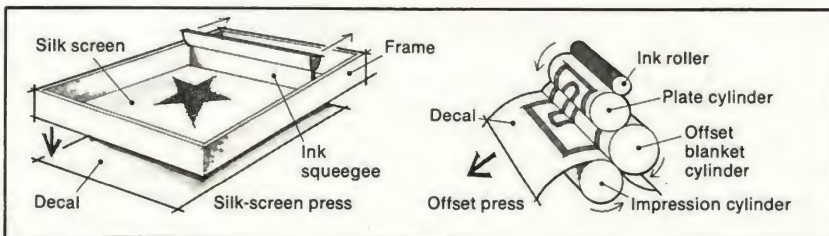
Silk screen. When the silk screen is "burned," the clear areas of the negative allow light through to weaken a blockout material coating the screen. The screen is developed and the image area is washed away. The silk screen is held flat and tight in a frame on the press. The de-



This graphic arts camera reduces oversized artwork to final size negatives.



It takes these eight negatives to make this Scalemaster decal. Each negative will make a silk screen for one color.



cal paper is positioned and the frame drops down onto the paper. The silk screen comes in contact with the paper as a rubber squeegee rolls a bead of ink across the screen. The ink passes through the image areas of the screen and onto the decal. The frame then rises, the decal is removed, and a fresh one positioned in its place.

The order of application of the inks usually starts with the lightest colors first, and certain designs must allow the "trapping" of one color with another. A good example of this is the U. S. national insignia where the dark blue field surrounds the white star and stripe. With either printing method, each ink must dry before the next color is applied. Strict environmental controls must be used so that the paper is not affected by humidity

or temperature. If the paper shrinks or expands, it will be impossible for the subsequent colors to register.

Decals are usually printed on large sheets of paper with many different decals on each sheet. After the decals have dried completely, the sheets are cut down to final size and the finished decals are packaged and shipped.

Lloyd Jones

Lloyd Jones has been in the decal business since 1968, researching and creating artwork for Revell, U. S. Airfix, Monogram, Testor, Minicraft, War Eagle, Eagle's Talon, J&L, and IPMS/U. S. A. Decals, in addition to his own Scalemaster Decal line. Lloyd has been an active member of IPMS/U. S. A. since 1963.

STEP-BY-STEP DECAL APPLICATION



1. After the painted model has dried thoroughly it is ready for the gloss coat. If any clear parts are installed, be sure they remain masked since some clear coats can craze styrene. The gloss does not have to be glass-smooth but it should create some reflections. The gloss coat should be allowed to dry at least 24 hours.



3. A setting solution may be used underneath the decal as well. This will help prevent air bubbles underneath the decal.



2. Some modelers cut away as much of the clear film as possible. Some decal brands are printed on a full sheet of clear film and have to be cut out individually. Too much pressure on the blade may fracture the inked areas, so use just enough pressure to cut through the clear film.



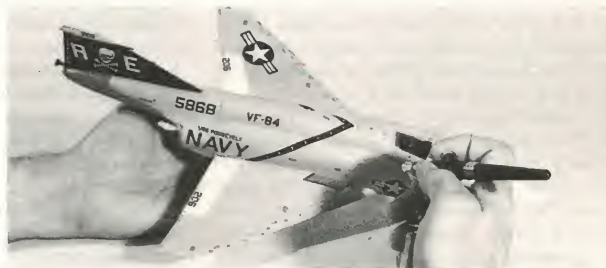
4. Soak the decal in lukewarm water for a few seconds. Remove the decal and set it aside for about one minute, or until the decal moves freely on the paper. Using tweezers, carefully place the decal and paper in the proper location on the model. Hold the decal in place with a cotton swab or soft eraser and slide the paper away. This method is especially helpful when applying stripes or any long, thin decal. Final positioning should be done carefully with a swab or eraser. To make sure a stripe is straight, sight along the surface of the model.



6. Setting solutions, decal adhesives, and water-borne minerals will leave a residue that could stain the model so it is important to remove excess solution with an absorbent cloth or swab. Dried residue can be removed with a damp cloth or swab. The decals may still be soft so carefully work around them. After the model has dried completely, inspect each decal for bubbles and areas that require more setting solution. Let the model dry at least 24 hours before applying any overcoats.



5. Once the decal is in the desired position, apply more setting solution. Make sure that all the edges are wet. Do not press the decal as it may be damaged. Decal one complete side of the model and allow it to dry before turning the model over.



7. Some modelers choose to apply an additional gloss coat over the decals even when the final finish is flat. This helps hide the edges of the clear film. Again, allow 24 hours' drying time between the gloss and flat overcoat. When using clear lacquers such as Floquil's Crystal Coat and Flat Finish, dust on the first coat or two. Wet applications might craze the decals and paint.

● **Tangled decal.** *Symptom:* decal folded over itself and hopelessly snarled. *Cause:* too much movement of the decal when applied. Often the decal edge gets caught on a panel line and the rest of the decal “trips” over the edge. *Solution:* Remove decal from model and refloat it in water. As it floats it will straighten out. Replace decal onto original paper or waxed paper and reapply (carefully) to model.



● **Fractures.** *Symptom:* Decal disintegrates as it soaks in water, Fig. 10. *Cause:* Clear carrier is too thin, or decal has been affected by temperature and humidity extremes. *Solution:* If this problem occurs on a new sheet, take it back to your vendor for exchange. A clear overcoat sprayed onto the decal sheet will act as a carrier film, but each piece will have to be cut out individually. Always store decals in a cool, dry environment.

● **Yellow clear film.** *Symptom:* Clear areas of the decal have a yellow tinge. *Cause:* Old decal clear film has reacted with the decal paper and has turned yellow. *Solution:* Tape decal face out on south-facing window. After several weeks or months, sunlight will bleach out the yellow film. Inspect the decal periodically; sunlight could also bleach out red and yellow pigments on the decal, but this should not occur before the clear film bleaches out. Make sure the window doesn't "sweat" from indoor humidity. If the decal gets wet and is allowed to dry, it may not come off the decal paper again.



● **Ink runs.** *Symptom:* Colors begin to run and stain the model, Fig. 11. *Cause:* Decal setting solution is dissolving the inks. *Solution:* Use a different type of setting solution or use no solution. This problem may occur with foreign-made decals.

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You can hand-paint your own markings on a clear decal. Al McGivern used cell-vinyl paints on these markings for the jacket of the Series 77 90 mm WWII bomber pilot figure. You can also use dry transfer letters such as Letraset or Chart-pak, applied to available clear decal sheets. A clear overcoat will prevent them from being damaged as they are transferred to the model.

• **Decal does not stick or respond to setting solution.** *Symptom:* No matter how much setting solution you put on the decal, it remains stiff and does not conform to surface detail. *Cause:* Some older decals were printed with carriers and inks that are not affected by ordinary setting solutions. *Solution:* Experiment with solvents that are compatible with the plastic and paint on the model. If none of these work, dilute some white glue in water, brush onto the model, and apply decal. This will help attach the decal but will not make it conform. **FSM**

SOURCES:

Here are the addresses of after-market decal companies. Look for their products at your local hobby shop.

AJS, Twinn-K Inc., P. O. Box 31228, Indianapolis, IN 46231, *automobiles*.

Americals, 4373 Varsity Lane, Houston, TX 77004, *WWI aircraft*.

ATP, P. O. Box 2891, South San Francisco, CA 94080, *airliners*.

Autodecal, Auto World International, 701 North Keyser Avenue, Scranton, PA 18508, *automobiles*.

Bare-Metal Foil Company, P. O. Box 82, Farmington, MI 48024, *military aircraft*.

Fred Cady Design, P. O. Box 576, Mount Prospect, IL 60056, *autos, race cars*.

Combat Models, 1633 Marconi Road, Wall, NJ 07719, *aircraft*.

Detail & Scale Decals, Aero Publishers, Inc., 329 West Aviation Road, Fallbrook, CA 92028, *military aircraft*.

Fowler Aviation, P. O. Box 148, Sunnymead, CA 92388, *military aircraft, airliners*.

Golden Wings Enterprises, P. O. Box 923, Wichita, KS 67277, *aircraft*.

Jet Set System, 549 G La Rambla, Ponce, PR 00731, *airliners*.

Microscale Decals, Krasel Industries, Inc., 1821 East Newport Circle, Santa Ana, CA 92705, *military aircraft, airliners, armor*.

Model Point America, P. O. Box 27435, Denver, CO 80227, *automobiles, race cars*.

Modeldecal, c/o Modeltoys, 246 Kingston Road, Portsmouth, Hants, England, *military aircraft*.

Scalemaster, 1525 West MacArthur Boulevard, No. 20, Costa Mesa, CA 92626, *military aircraft, airliners*.

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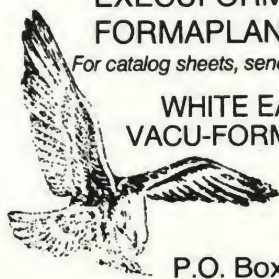
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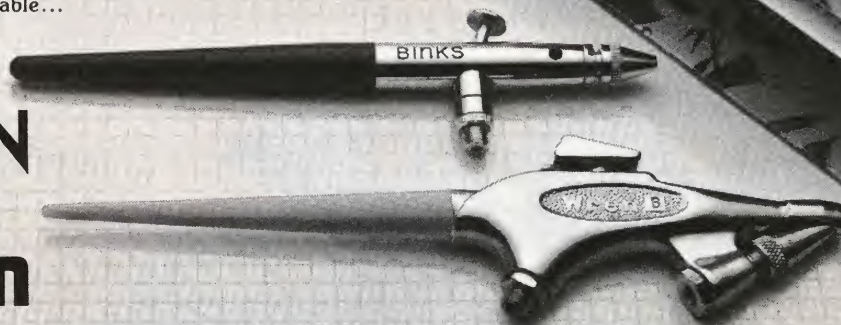
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Modeling the Albatros D.II in 1/72 scale

An ambitious conversion project that includes unusual painting techniques

BY JOSEPH GIANFRANCESCO

IN THE SPRING of 1916 air superiority on the Western Front had swung in favor of the Allies. The "Fokker Scourge" ended when the seemingly invincible Eindecker met its match in the Nieuport 11 and de Havilland DH-2 pusher. But with the introduction of the sharklike Albatros in late 1916, Germany once again held the advantage in the air.

The success of the Albatros was due mainly to its Mercedes D.III engine which allowed the plane to carry two machine guns with no adverse effects on airspeed or rate of climb. All the great German aces of the time, and many of the greats to be, flew the Albatros. The D.I and D.II were gradually replaced by the superior D.III.

Begin with the wings. Converting the Revell D.III (kit No. H-4110) to a D.II involves construction techniques that can be used for most World War One-era aircraft, Fig. 1. The wings of the D.III were quite different from those on the D.II so I had to scratch-build them.

Using the templates in Fig. 2, I traced the shapes of the wings onto paper, cut them out, and penciled their outlines onto a sheet of .060" styrene. I scored the wing outlines lightly with a knife and snapped them out of the sheet. I rounded the leading and trailing edges with a sharp blade, and then finished with wet 400-grit sandpaper, making the trailing edges as thin as possible.

The proper airfoil shape was produced by burnishing, Fig. 3. I placed the wing upside down on a yielding surface such as a block of soft balsa or hard plastic foam, and vigorously rubbed it spanwise with a teaspoon lubricated with butter. This procedure will give the wing a permanent and consistent curve with a minimum of effort. The butter is easily washed off with soapy water.

Rib detail. First, I drew in the rib and aileron joint lines with a soft pencil using the wing template as a guide. I



All photos, FINESCALE MODELER: Paul A. Erler, unless otherwise credited.

Joe's Albatros D.II conversion from the Revell D.III. Note the Windhoff radiators and parallel main struts of this earlier variant. The wings had a shorter span than those on the D.III. Note the squared wingtips and absence of the radiator on the top wing.



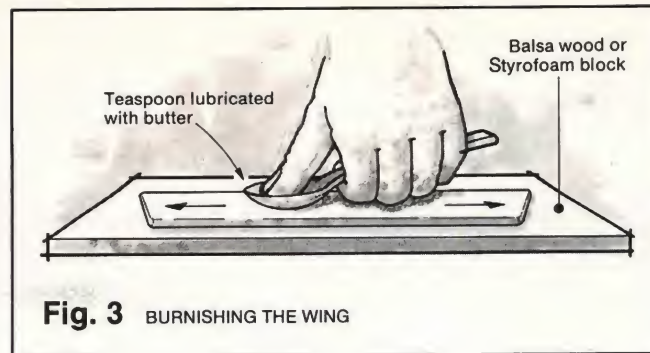
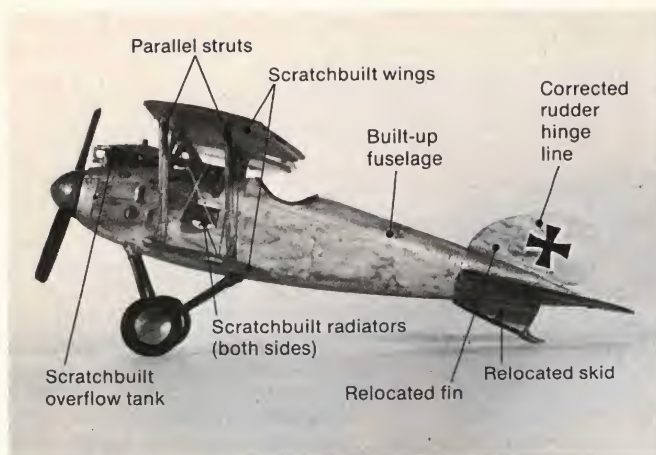


Fig. 1. Overview of Joe's Albatros D.II conversion of the Revell 1/72 scale D.III.

then scored in the aileron outlines, leaving the ailerons attached for now.

After the wing was marked out, I applied a coat of Floquil's Crystal Cote. Next, I used Letraset* 1/64" glossy black chart tape (Letraline No. 1311) to simulate the rib structure, Fig. 4. The

*Letraset USA, Inc., 40 Eisenhower Drive, Paramus, NJ 07652.

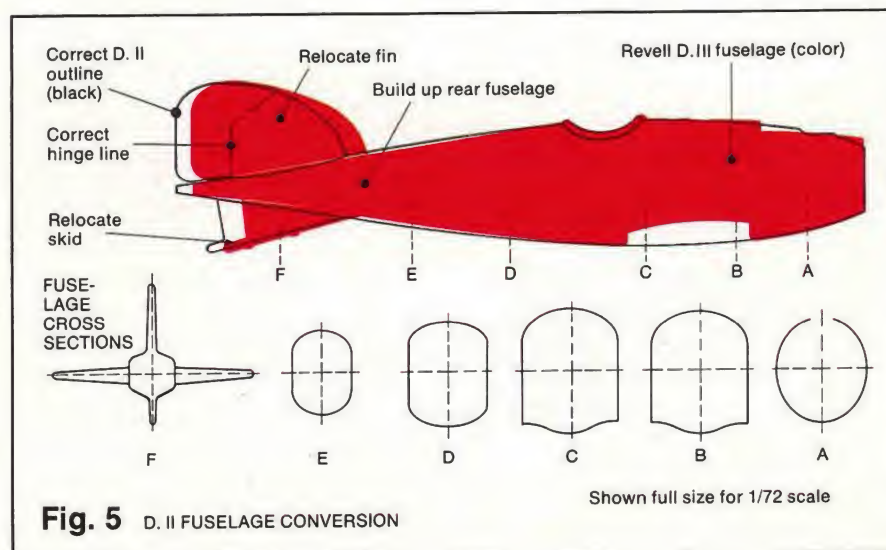
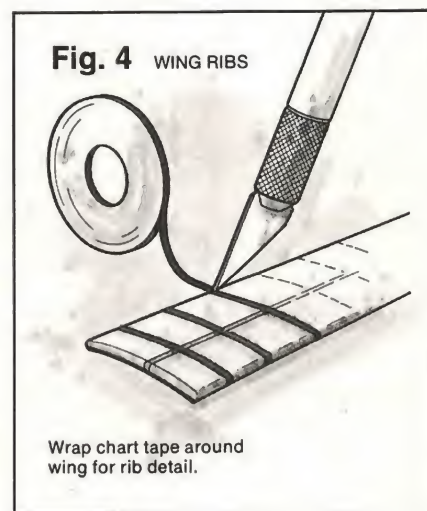
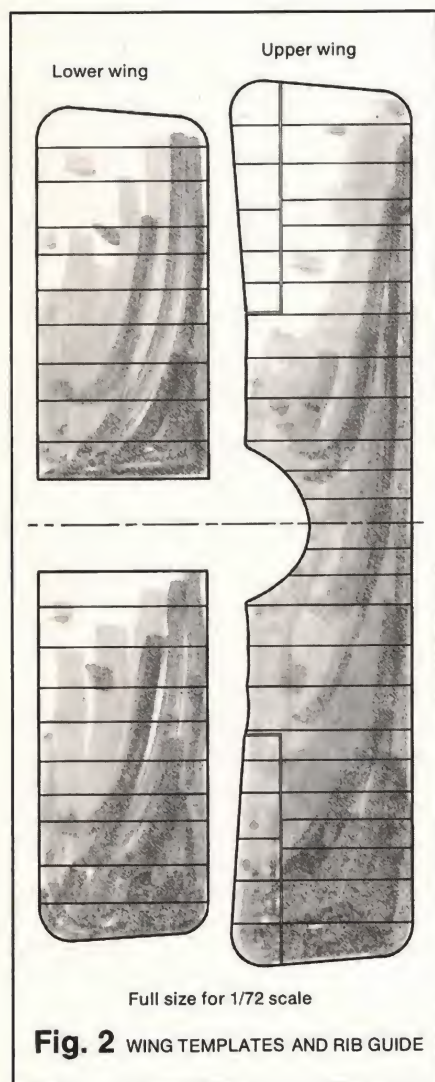
Crystal Cote gives the tape a good bonding surface, otherwise the graphite pencil lines cause the tape to lift off. I applied the tape by cutting off a generous length and carefully pressing it onto each line, wrapping it around the leading edge, back across the lower surface, and trimming at the trailing edge.

I sealed the ribs with three wet coats of Crystal Cote, sanding lightly with 600-grit sandpaper between coats. The wet coats build up the areas between the ribs to achieve a realistic simulation of a fabric-covered wing with rib tapes. The glossy surface on the tape tends to repel the paint, which fills in the low spots, and sanding between coats helps accentuate this effect. I applied a primer coat of gloss white enamel.

The tapes were so well sealed that I was able to neatly taper the ends with sandpaper. I always sanded in the direction of the tapes and away from, never into, the ends. I completed the wings by cutting off the ailerons and slightly rounding the leading edges. I raised the right aileron and dropped the left to add a little action to the

model. Then I washed the wing and gave it a final light coat of Crystal Cote.

Modifying the fuselage. I began fuselage construction by removing the vertical fin and tail skid. I reshaped them according to the drawings, Fig. 5, cutting away the rudder to the correct hinge line, and set them aside.





Collect-Air Photos

A vintage photo of Albatros D.IIs in service, circa winter 1916.

Revell's kit comes with no interior. I added a basic instrument panel, seat, and stick from sheet styrene and stretched sprue. I added seat belts made from masking tape. The color and texture of the tape is just right for unbleached muslin straps. When the cockpit was detailed to my satisfaction, I glued the fuselage halves together.

Converting the D.III to the D.II fuselage involves the use of epoxy putty. I used Duro Twist E-pox-e Ribbon* which is available in most variety or hardware stores. It is a two-part, blue and yellow strip wrapped in cellophane. Simply cut off a small length (a little goes a long way) and knead it together

*Duro/Woodhill Chemical Corp., Cleveland, OH 44128.



until it is a uniform green color. It is easiest to use during the first half hour after mixing, but it remains workable for two or three hours, and cures hard overnight. Before mixing, cut away the portion where the two parts meet; they have already reacted with each other and will leave small chunks in the putty.

Epoxy putty is better than lacquer-based fillers for building contours since it can be exactly pre-shaped before applying it to the model. Thick applications cure with no shrinkage, and an even surface can be achieved by smoothing the putty with a wet finger before it sets up. Since epoxy putty has adhesive properties, I use cooking oil as a release agent on the model for any parts that need to be repeatedly test-fit and reworked.

The Revell fuselage is too narrow at the tail, Fig. 5. I built up the rear fuselage using the cross section templates to get the right section. I rolled the putty into a $\frac{1}{16}$ "-thick sheet, cut rough shapes, and laid them on the model. Using a knife and wet fingers, I cut the putty slightly undersize and then smoothed out the edges to fair them into the kit fuselage. Remember, whatever you remove while the putty is soft and workable you won't have to deal with after it is cured and hard.

To work the putty, I used old dental tools and paintbrush handles that had been cut to various shapes. Details such as panel lines and inspection panels were gently engraved into the surface.

After the putty had set up, I flat-

tened the sides with sandpaper using the cross section templates as a guide, Fig. 5. I attached the vertical tail and skid, making sure they were square and in the proper location. The small fuselage section from the lower wing of the Revell kit, part No. 6, was cut out and carefully fitted to the fuselage.

Radiators. I made each Windhoff radiator out of sheet styrene, Fig. 6. To simulate the cooling gills on the sides, I wrapped nylon sewing thread around the center piece, and sealed it with a light coat of Hot Stuff. Next, I carefully sanded the thread off the inside and the edges. The grillework on the front face of the radiators was scribed in with a knife, but a good alternative is to use some fine brass screen.

The Windhoff radiator arrangement on the early D.II used an expansion tank on top of the engine, just to the left of the cylinder heads. I made mine from sheet styrene. The filler cap at the top and the water tube leading to the engine are stretched sprue.

Creating the wood grain effect. I find it easier to paint biplanes before attaching the wings and tail to the fuselage. The real challenge in painting this model was simulating the subtle grain of the varnished wood panels found on the early D.IIs.

First, I applied a coat of Crystal Cote to smooth out the fuselage. Next, I painted the metal nose panels and masked them off. A base coat of Humbrol Mast Oak (No. HC5) was next, followed by another coat of Crystal Cote. I also applied these colors to a chip of sheet styrene to serve as a practice



Fig. 7. Joe used striping tape to mask off the wood panels.

piece for the graining technique. The Crystal Cote acts as an inert barrier between the base coat and the oil-based washes that follow. If you overdo it, you can remove them without damaging the base color.

I established the margins of the individual panels with $\frac{1}{16}$ " flexible striping tape called "Color Stripe," Fig. 7.* First, I defined the edges of the upper and lower main fuselage longerons on both sides of the fuselage. Then I masked off the edges of every other panel on the fuselage sides, carrying the tape completely around the fuselage. Make sure the tape stays in contact on the round fuselage.

Using a sharp knife, I scribed in the panel lines along the edges of the tape. I used just enough pressure to score the gloss coat; the washes will pick out the panel lines. Nailheads on the plywood can be beautifully simulated by lightly running a pounce wheel (a toothed wheel used to transfer sewing patterns) along the edges of the panel.

The wood grain effect was done with several shades of thinned Humbrol paint, a $\frac{1}{8}$ " round brush, and a No. 0000 brush. Working first on the practice piece and then on the fuselage, I used thinned out Clear Doped Linen (HB16) lightly streaked on with the $\frac{1}{8}$ " brush. Then I blotted the brush dry and went back over it again. Next, I used the same technique with German Pale Yellow (HG7). These two colors alone produce a subtle grain effect that is ideal for the lighter panels. To accentuate the grain without making it dark-

er, I applied minute dots of these colors on each panel. I lightly pulled the dots back and forth with a thinner-dampened brush, producing a feathered effect.

Next, I followed with Natural Wood (MC24) and Neutral Grey (HU3) using the same procedure. I found the gray especially useful for creating a realistic weathered wood effect.

I removed the tape from the fuselage and repeated the wood grain effect on the remaining panels, masking each as I went.

The wings and horizontal stabilizer were painted in the early 1916 scheme of brown and green using Humbrol's British Dark Earth (HB2) and German Dunkelgrun 71 (HG2). The color separation lines were built up with a series of short bursts with the airbrush instead of trying to achieve a fine line with one pass. The underside of the wing and stab were done in Russian Underside Blue (HT2).

Final assembly. I attached the lower wings to the fuselage at the same angle of attack as the kit wings. I made the small wing root fairings from epoxy putty. The landing gear was installed next; I made sure that it was square by eyeballing it from the front and back. I trimmed the upper locating pins from the ends of the cabane struts and canted them out to the proper angle. I then mounted the upper wing to the cabane struts, aligning it carefully.

The D.II had parallel interplane struts so I cut apart the kit's V-shaped struts and carefully fitted them between the wings. I sometimes reinforce struts by drilling tiny holes in the ends and inserting short lengths of .008" wire; a broken guitar steel E string is perfect! Then I drill small holes in the wings and mount the struts with Hot Stuff.

Rigging. I used fine wire for rigging the Albatros. I drilled a small hole at the lower wing root and at the forward metal panel of the nose on each side. These are drilled all the way into the hollow fuselage. I glued one end of each wire to the interplane strut and simply inserted the other end into the holes. This method produces a perfect fit even if the wire is cut a little too long; the extra length is hidden inside. This also prevents the wires from sagging in warm weather.

I attached the wheels, prop, and radiators with Hot Stuff and used the decals from the Revell kit. The model, placed next to a stock Revell D.III, illustrates the various changes made to the Albatros airframe during its development.

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The author wishes to thank Chuck Hards, Gary Ott, and Dave Wilson for their considerable assistance in preparing this article.

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The ragtag collection of infantrymen rushes across the open fields of Gettysburg. Note how the surrounding figures direct the action back toward the center of interest.



FSM SHOWCASE

Lance Krieg's 1/32 scale diorama of Gordon's Brigade at Gettysburg

LANCE KRIEG'S main modeling interest is World War One aircraft, but after a recent vacation which included a stop in Gettysburg, Pennsylvania, his interest in the American Civil War reawakened. Lance told FSM how he produced his diorama.

"The diorama depicts elements of the

26th Regiment, Georgia Volunteer Infantry, known as 'Gordon's Brigade,' at the Battle of Gettysburg on July 1, 1863. This unit was part of the Confederate Army under Lieutenant General Richard S. Ewell. Two of the men have been hit, and the flag bearer is depicted as still recoiling from the blow.

"The figures were built from Tamiya, Airfix, and Italeri German infantry parts. I separate every figure I buy into component parts, then mix and match them to approximate the poses I envision. Since the Springfield and Enfield rifles would be difficult to scratch-build in 1/35 scale, I used the 1/32 scale



This photo, FINESCALE MODELER: Paul Boyer. All others, Woody Saddoris.

H - R Products* and Imrie/Risley** castings. That meant that the 1/32 scale figures had to be enlarged to 1/32 scale. This was done by inserting small disks at the waist, knees, ankles, and elbows to bring them up to scale height. Although this sounds difficult, it really wasn't.

"The cuffs, pant legs, hats, canteens, cap boxes, belt buckles, jackets, and the fingers on individual hands were sculpted using Duro Twist E-pox-e Ribbon.*** The cartridge boxes were made from sheet styrene, and the 2" belts from typ-

*H - R Products, P. O. Box 67, McHenry, IL 60050.

**Imrie/Risley Miniatures, Inc., P. O. Box 89, Burnt Hills, NY 12027.

***Duro/Woodhill Chemical Corporation, Cleveland, OH 44128.



Lance's dramatic, effective posing of each figure creates peak action in a motionless diorama. Putty was used to produce the facial expressions and more realistic fingers.



The falling flag bearer is the center of interest in the diorama. Note the patched pants and split shoes.

ing paper. The Union kepi is an H - R casting. The red crescent represents the 1st Division, XI Corps, which was caught in an earlier skirmish.

"The Confederate flag and the Union blouse on the ground were made from the foil from a wine bottle. The flag was painted with enamels because of their flexibility — I wanted to avoid cracks in the paint when the flag was folded. I used Microscale white stars and letters, along with Scalemaster white stripes. The canteens and blankets also have decal stencils.

"The groundwork is plaster with static grass and clumps of hemp cut from twine. Small ferns and other deco-

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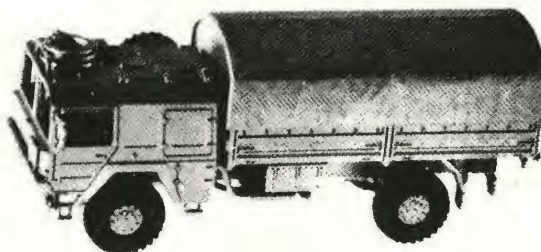
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One of the objectives of the Confederate Army's push into Gettysburg was a supply of shoes. Lance's shoeless soldier charges toward the town.



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rative plant leaves were used to simulate the weeds and rough grasses. The downed fence rails were made from balsa, and the rocks along the fence line are small stones. I made the 12-pound cannon balls from epoxy putty, and rifle ramrods from fine wire.

"Since most figures' hands look unrealistic, I cut off all the fingers and made replacements with epoxy putty. These were attached with super glue and bent into position. I carved fingernails and creases with an X-acto knife. The joints of the fingers to the hands were filled with thinned-out Squadron Green Putty. Thinned putty was also used to change expressions on the faces, close eyes, and build up noses, cheeks, ears, and lips.

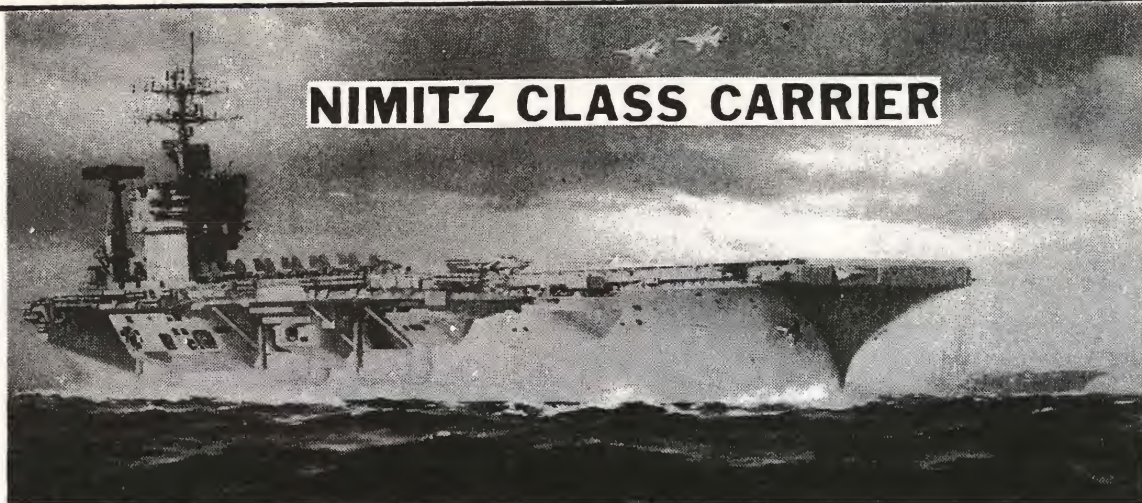
"I used Winsor & Newton oils to paint all the figures and clothing. I also used Floquil, Pactra, and Testor metallics, and I airbrushed enamels onto the groundwork. All dry-brushing was done with Polly-S.

"The diorama took 150 hours to complete, each figure requiring nearly 15 hours of work to animate and paint. The effort was worth it since the diorama was judged as the best figure diorama at the 1983 IPMS national convention in Phoenix."

FSM



Lance animated each soldier by assembling components from different figures. Epoxy putty was used for added details.



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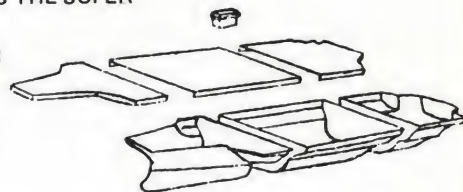
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Photographing carrier-deck action on dry land

Realistic model photos shot with a minimum of equipment

BY DAVID TIPPS

PHOTOGRAPHY BRINGS a special scale viewpoint to models, a viewpoint that most of us can't achieve without some excruciating contortions and a good deal of imagination. It's exciting to see your models come alive in photos taken with the right camera angles, lighting, and background, and, for me at least, scale photography is a natural part of scale modeling.

Heading for the great out-of-doors. Outdoors is the best place to photograph models, and, given the right background, the most dramatic place

as well. The main purpose of this article is to inform modelers of the advantages of photographing models outdoors, versus the traditional indoor approach.

In the past a false assumption that the great outdoors, being big, and models being small, should not be mixed has kept some model photographers indoors. Today, you can leave the artificial lights and backgrounds indoors. Venturing outdoors you will discover that when perspective is used properly, the scale model will blend naturally with the environment. Charged with abundant sunlight, brilliant blue sky, dramatic cloud formations, and wide

horizons, nature provides all the variety in backgrounds you could ask for. In fact, the only real work required to shoot model photos out of doors is building an appropriate scale base.

Building your own carrier deck. To simulate a modern carrier deck I used $\frac{1}{4}$ "-thick art board, Fig. 1. This type of board is covered with white paper and closely resembles lightweight Sheetrock. The board I purchased measured 5' x 4', more than ample to fill my camera's viewfinder. The surface of the board is quite smooth, and when spray painted it makes a convincing metal surface. This is important, since you need a surface texture that is in scale

Sunrise, and a 1/48 scale Skyraider is just starting to crank over. All the dramatic photos in this article, including this issue's cover shot, were made using a simplified carrier deck built in an afternoon.



An unlikely lineup — A-1 Skyraider, A-7E Corsair, and F-8E Crusader — on a cardboard carrier deck. Nature supplies both the lighting and the background for these striking model photos taken atop a sand dune at the water's edge.

with the models you plan to photograph. Everybody has seen snapshot photos of a model posed on a sidewalk, where the out-of-scale pores in the concrete look as big as moon craters next to the model, completely destroying any illusion of realism.

To make the carrier deck markings I masked the art board with two different widths of chart tape before painting it. The tape I used was a graphic arts product called Zipaline* which can be found in art or office supply stores. Although the color and pattern don't mat-

ter, I chose striped and colored tapes so they would show up against the all-white board while I applied them, Fig. 2. To mask the large "23," I applied self-adhesive vinyl numbers, also from an office supply store.

I used two tape widths, 1/4" and 1/16". It's best to press the tape down lightly, because pressing hard can cause the paper covering on the art board to lift or tear when the tape is removed. I found it helpful to run the sticky side of the tape across my forehead before laying it down; the skin oil helps reduce the stickiness of the adhesive.

As an alternative to masking and painting, I've also had success with



Meet David Tipps

David, 37, has been building plastic model aircraft for 15 years, and comments, "I enjoy WWII aircraft, however I find myself building more jets than anything else. I love building airplanes and then taking pictures of them. To me, the airplane is one of the most beautiful shapes of our time, and to capture that shape on film, be it a model or full scale, is just plain fun."

David is an active member of the Fort Lauderdale IPMS "Flight 19" chapter, and the Southern Florida Airline Historical Association. He's also an associate member of the Tailhook Association and the Air Force Museum Foundation.

David has a B.S. degree in sociology from Eastern New Mexico University. He is a police officer for the Metro-Dade Police Department in Miami, Florida, where he is assigned to the police academy as a training adviser. He and his wife Susan ("my best objective critic," he reports) have two children.

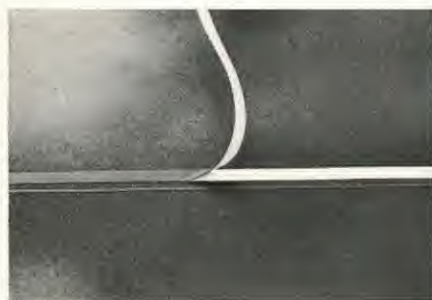
*Zipaline tape No. G-24-41-M, manufactured by Zipatone Inc., 150 Fencil Lane, Hillside, IL 60162.



Fig. 1. Materials for the carrier deck photo prop are simple: a 4' x 5' sheet of 1/4" art board, self-adhesive numbers and chart tape, and a spray can of flat black paint.

painting the board flat black, then laying down white lines using Avery* self-adhesive correction tape, another office supply item. This tape is available in different widths, and it is thin enough

*Avery Label, Monrovia, CA 91016.



Figs. 2, 3, and 4. The first step is to mask the deck numbers and stripes (top) before painting the deck (middle). When the paint has dried, remove the tape and numbers to reveal the markings (bottom).

that it's hard to tell that it's not really painted-on stripes.

After all masking was complete I sprayed the entire board with flat black primer, Fig. 3, allowed the paint to dry, and removed the tape and numbers to reveal the white markings, Fig. 4. I then set the deck up on four 4-foot sawhorses, Fig. 5, on a sand dune approximately 500 feet from the shoreline. With my models spotted on the deck, I was ready to begin taking pictures.

Techniques for the daylight photos.

Figure 6 shows the basic setup for all my carrier deck photos. My camera is a Nikon F2S with a Tokina f2.8 wide-angle lens, but almost any 35 mm single-lens reflex (SLR) camera is capable of shooting similar photos. The camera is placed on the land side of the carrier deck prop, facing the water at deck level with the bottom edge of the lens resting on the surface of the board. Try to shoot from below wing level as much as possible, because this camera angle duplicates the point of view of someone

standing near and looking at the real thing.

The first thing to check through the viewfinder is that the camera is level with the horizon. Next, look again to ensure that background objects are far enough away to appear in scale with the model, and that there is nothing on the deck that is not the same scale as the model. Double-check before you shoot.

Depth of field considerations. I usually move in as close as I can to the main subject, stopping when the viewfinder is filled with the airplane (approximately 10-12" with my wide-angle lens), then begin focusing. Remember, the closer you get to the model, the more critical focusing becomes. This brings up the problem of how to keep the airplanes in back of the main subject in focus.

Depth of field is the most critical aspect of close-up photography. It is the range, or depth, of sharp focus in the photo, and ideally that range should include an area in front of the model, the model itself, and some area behind the model. If these areas all appear in focus, then you have good depth of field.

When you move in close to a subject the depth of field becomes very shallow. I use three techniques to achieve good depth of field, or to put it another way, to keep everything in focus at one time:

- Shoot at smallest aperture setting (lens opening) that your lens has. This is the highest numbered f-stop on the lens, usually f16, f22, or f32. Remember that high f-stops require longer exposures (slower shutter speeds) to properly expose the film.
- Use a wide-angle lens. The common wide-angle lens sizes for 35 mm SLR cameras are 28 mm and 35 mm. A wide-angle lens increases the apparent distance between near and far objects, producing an illusion of great depth.

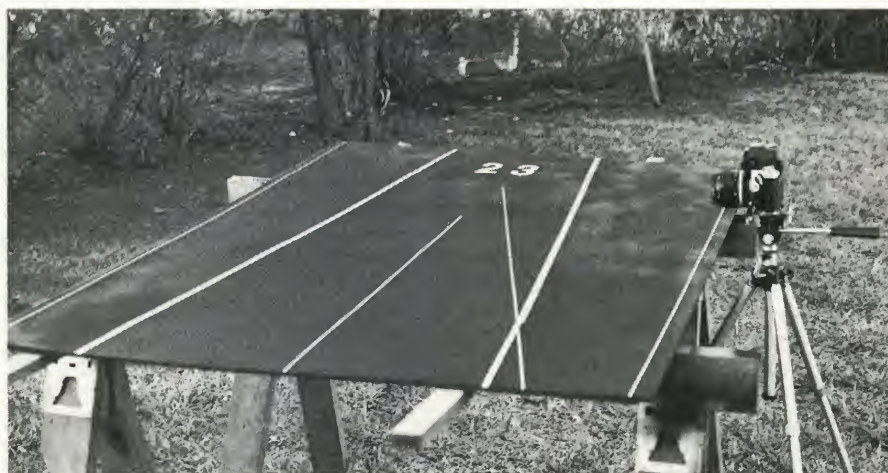
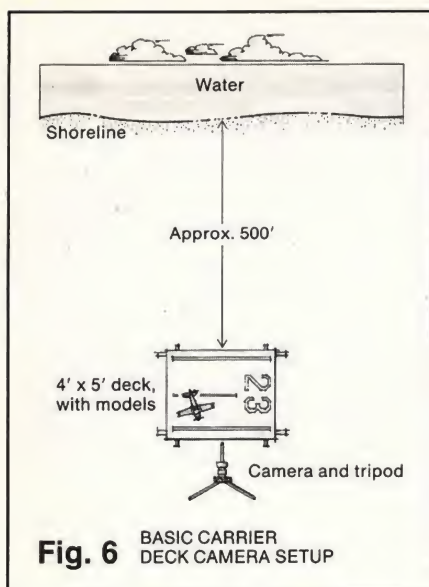


Fig. 5. The completed carrier deck. Note the long pieces of lumber placed under the 1/4" art board sheet to keep it from sagging in the middle.



However, don't get too close to the model; in extreme close-ups wide-angle lenses can cause distortions such as curved wings or banana-shaped fuselages.

● As a last resort, move the camera away from the model.

For my daylight pictures I used Kodachrome 25 ASA slide film with an aperture setting of f16 and a shutter speed of 1/30 of a second. I hand-held the camera for these pictures, which is a little risky — at 1/30 of a second any movement of the camera may show up as a blurred image on the film. A tripod is mandatory to steady the camera when using any shutter speed slower than 1/30 of a second, and it isn't a bad idea for speeds of 1/30 or 1/60.

The sunrise photos. The carrier deck and camera setup for the sunrise pictures is almost identical to the daylight photos — you just have to get out of bed a lot earlier! The camera must be mounted on a tripod for these photos, and once again the lens is placed at deck level. Focusing is trickier than for daylight shots because while the sun is coming up the models are mere silhouettes against the brightly lit background, Fig. 7. I focus on any distinct vertical form on the aircraft such as the nose gear or a propeller blade. If your camera has a split-image focusing ring it really comes in handy here.

Most of the sunrise shots were taken using an aperture setting of f16 and a shutter speed of 1/10 of a second. I used Kodachrome 64 ASA slide film for the sunrise pictures, which is faster film (more sensitive to light) than the film used for the daylight shots.

Shooting into the sun can cause unwanted glare and "flares" in your photos, especially where the sunlight bounces off the water. As the sun rose higher during my sunrise shooting ses-



Fig. 7. This Minicraft 1/32 scale A-4 Skyhawk was purposely silhouetted against the sunrise so the model's distinctive Blue Angel markings wouldn't be visible.



Fig. 8. The prop movement in this shot of the author's Monogram 1/48 scale Skyraider was as natural as the lighting — a breeze came up during the photo session and moved the prop just enough to suggest motion!

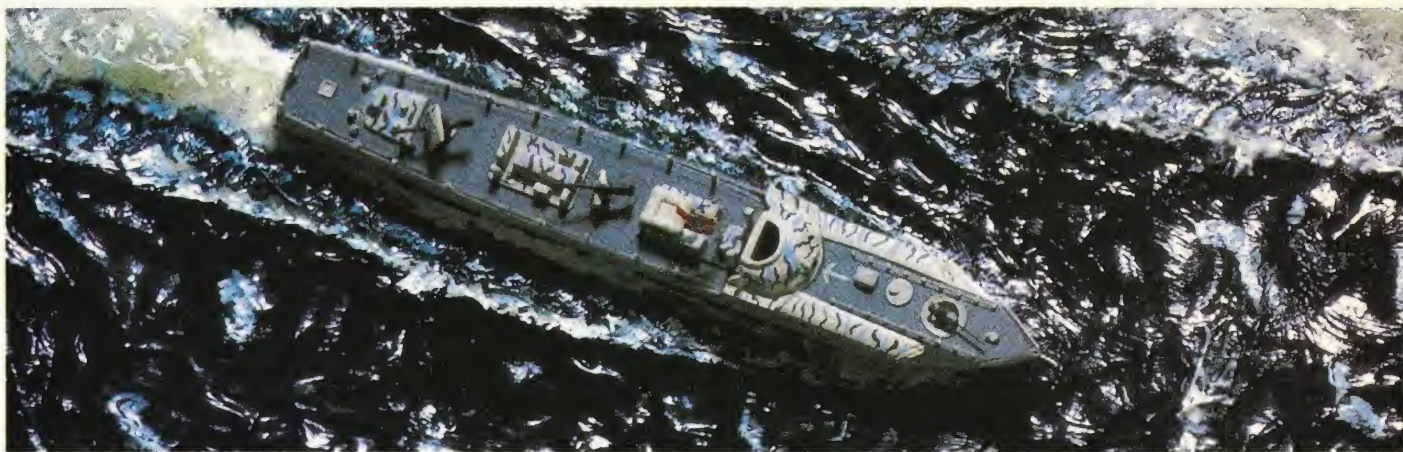
sion I added a polarizing filter to my lens. By rotating the polarizing filter you can "dial out" part or all of the glare in the picture.

An easy special effect! While preparing for this shooting session I had intended to use a battery-powered fan to turn the prop on my Skyraider. However, once I spotted the plane on the deck, the light sea breeze immediately caused it to crank over, Fig. 8. At the

slow shutter speeds required to ensure good depth of field the propeller needed only to turn a little to produce convincing blurred-motion effects.

Taking pictures of my models has increased my enjoyment of the hobby 100 percent, and I'll bet it can do the same for you. Don't allow the cloudy mystique that sometimes seems to surround photography to keep you from giving it a try.

FSM



Much of the visual impact of "Schnellboots in the Channel," a diorama based on the Heller 1/400 scale models, comes from

the realistic water base. Look hard and you'll see that the lead craft has just launched torpedoes to port and starboard.

Modeling water with artist's acrylic gel

Dramatic wakes and waves suitable for ship bases and dioramas

BY DENNIS MOORE

TO ME, a model of a powered warship on a plain wooden base or stand just doesn't look right. It doesn't matter whether the model is a water-line version or full-hull, it's just not as impressive as it should be. Posing the ship on a water base is dramatic and much more to my liking, but that means solving the problem of what to use to give the appearance of the sea.

Finding an alternative to casting resin. When I first set out to build a realistic water base for one of my ships I gave some thought to using polyester casting resin. I watched a couple of demonstrations on the use of this material, but came away rejecting it for several reasons. First, the resin has a powerful chemical odor that can permeate your home for several days, and if not

mixed properly it can harden faster than you want it to, or not harden for days. Finally, when the hardening agent is added some resins can generate enough heat to melt a plastic model; that convinced me that I didn't want to try casting resin.

Instead, I found a material that has no strong chemical smell, doesn't have to be mixed, hardens at a reasonable pace, and most important to me, cannot melt the bottom of my models. It's called artist's acrylic gel, Fig. 1, and it's available at most art supply stores.

Acrylic gel — also called "gel medium" — was developed, I'm told, to allow artists to add textured or layered effects to acrylic paintings. The gels are formulated to hold their shape when formed with a brush or palette knife, so they work well for creating waves, splashes, and wakes. I've used two major brands of artist's acrylic gel:

Liquitex, and Grumbacher's Hyplar. Plastic bottles from 8 ounces through 1 gallon are available, and since the material has an excellent shelf life when stored at room temperature with the lid tightly closed, I usually buy a quart at a time.

As it comes in the bottle the gel is white, has the consistency of mayonnaise, and has a very slight sweet odor. It dries crystal clear. It can be spread with an ordinary table knife and worked into shape with the knife or a paintbrush. As long as it is not allowed to dry it can be cleaned up with warm water.

Selecting and finishing a base. The first step in modeling water with gel is to select a base. Here you have several choices. I've used picture frames as bases for single ships and for small dioramas involving 1/700 scale vessels. If you're going to use a picture frame, I



This aerial view of Dennis' 1/400 scale HMS *Exeter* shows off the realistic texture and colors of his acrylic gel water. The tech-

nique is simple and requires few tools and materials. Note how the wake blends into the areas of undisturbed water.



Color photos, FINESCALE MODELER: Paul A. Erler

suggest buying one with glass already in it and spreading the gel right onto the glass.

If you choose a solid wooden base similar to those shown in the photos you must take into account the overall size of the model and the size of the board. These gels are water soluble, and water plus wood can mean warping, particularly if your base is too long, too thin, or too wide.

Start with a 1"-thick piece of maple or willow no wider than necessary to allow room for your ship plus a side wake on each side. Bases more than 5" wide may twist as moisture from the gel penetrates them, and the longer the base, the more likely it is to bow up slightly at the center. Fortunately, most lengthwise warping will disappear as the gel dries and the moisture leaves the board over a period of days. If you're working with a large model, your best bet is to build a plywood base with a sturdy frame around the edges to keep the plywood from warping.

Finishing the base before applying the gel helps to seal the wood and prevent the moisture from warping it, especially on large bases. I use tung oil on my willow and maple bases, applying it at least a week before I plan to apply the gel, which gives the tung oil a chance to soak in thoroughly. Be sure

to remove as much excess surface oil as you can before starting to apply the acrylic gel.

Fastening the ship to the base. Actually mounting the ship on the base is easy — just spread a $\frac{1}{8}$ " layer of gel on the board (either going right to the edges or in an irregular pattern), then place the ship into the medium. If you are mounting a vessel built from a waterline kit, be sure to use the plastic bottom that comes with the kit — the flat bottom will squeeze the gel out from under the ship, where it can be worked into side waves, saving on material.

When mounting a non-waterline kit, remove the hull to just below the boot topping during construction, then mount the ship in the same way as a waterline model. You can save lots of gel and reduce the risk of warping the base on a large vessel by not applying gel to the area under the hull. Position the ship on the base and trace around the hull with a pencil, then apply gel to the base, extending it only 1" into the area covered by the hull, Fig. 2.

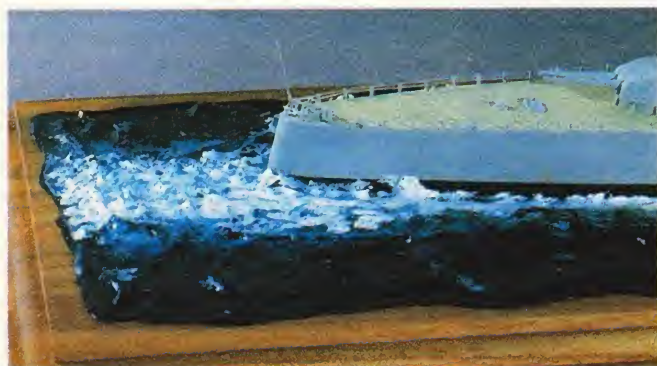
Working in waves and wakes. Even for a 1/400 scale battleship it takes only about 20 minutes to spread the gel over the base. Once the ship is in the gel begin to work the surface into the forms of waves, swells, and the ship's



Fig. 1. Everything needed to make gel water comes from an art or crafts store. Left to right: gel medium, acrylic tube colors, brushes, wood base, tung oil furniture finish, and acrylic gloss medium.

wake. Before I mount a ship I always check pictures of the vessel under way to see what wave patterns it produced at different speeds. In a moderate sea some ships are wet and others remain dry, even at speed, depending on hull design. For example, even at fairly low speeds the hull of a *King George V* class battleship was a good deal wetter than a *Dunkerque* class battle cruiser.

Once you have decided on the vessel speed you will depict, begin to shape the bow wave. Acrylic gel sets slowly, so you'll have plenty of time unless the humidity is extremely low. Work with



Close-ups of the *Exeter* show how the gel has been churned into the frothy white wake behind the ship (left) and worked up onto



the model's hull to make the high bow wave (right). The wet look comes from a final coating of acrylic gloss medium.



Fig. 2. The wood base for this large warship was marked to show the area to be occupied by the hull, then a heavy coat of gel medium was applied.

a No. 3 brush, carefully adding gel along the bow. Don't try for small details at this point; instead, simply work for a general outline.

Next add gel to represent the foam that laps along the side of the ship. If you are depicting a vessel at high speed, use a knife to add gel for the wake plume. Here again, work only for general patterns. Make the long waves that extend away from the bow by adding gel with brush or knife and moving material up from both sides of the wave, creating a trough. Swells and waves in areas not affected by the movement of the ship can be made in the same way.

After allowing the gel to dry for

about 30 minutes go back and begin to peak and indent the wake and waves. This may mean simply using your No. 3 brush on the material that is already there, or it may involve adding small amounts of gel. Large splashes and other tall vertical features must be built up with repeated applications of the gel, and one of the best features of this material is that more can be added at any time. Another convenient characteristic is that the gel will stay exactly where you put it as you work it into peaks and valleys.

Adding color with acrylic paints.

Once you are satisfied with the shape of the water surface, set the base aside to dry. Expect to wait at least 24 hours before starting to paint. It's easy to tell when the gel is dry because it turns clear as the water evaporates, Fig. 3. You can start to paint before the gel is completely clear as long as the surface of the gel thickened sufficiently to take a brush stroke. Carefully probing the surface with a brush handle will give you a good idea of whether the surface is tough enough to begin painting; if in doubt, let it dry for several more hours.

I use tube acrylics to paint the water, and only three colors are required: Grumbacher Hyplar Thalo Green and

Liquitex Phthalocyanine Blue mixed together for the dark areas, and Liquitex Titanium White for the wakes. Whenever possible I refer to color photos of the real ship to determine how much white and off-white blue-green to use.

Working with acrylic tube colors is a lot of fun because they dry quickly and you can come up with all kinds of subtle variations of color and shade. Use the paint straight from the tube; if you thin it with water it won't cover very well.

Lay down a coat of the blue-green first and let it dry, Fig. 4. The paint is dry when its surface becomes dull. Next work in white for the foamy water, and mix the white with small amounts of blue and green to make the in-between shades (see pages 60 and 61). Don't be afraid to go over areas where you don't like the initial results; that's what this kind of paint is made for. Try not to go overboard painting whitecaps in the areas outside of the ship's wake; this is the ocean that you're simulating, not the local lake!

After the paint has dried, overcoat it with Liquitex or Hyplar Gloss Medium to make the water look wet. Apply it with a brush, and don't put too much on. Take care to prevent bubbles from forming on the surface of the gloss medium; as the bubbles dry they break, leaving hundreds of unrealistic little rings. Try to work the bubbles out by brushing the gloss on thin and by blowing on the bubbles that do form to break them before they dry.

When the gloss has dried for an hour or so check your finished water. If you like what you see, you're done. If you don't, or if you feel the need for one more wave splash on the hull or one more swell, don't be afraid to add them by simply repeating the steps already outlined. I have done this months after the original application of gel and paints and have had no problems with blending in the new shapes and colors.

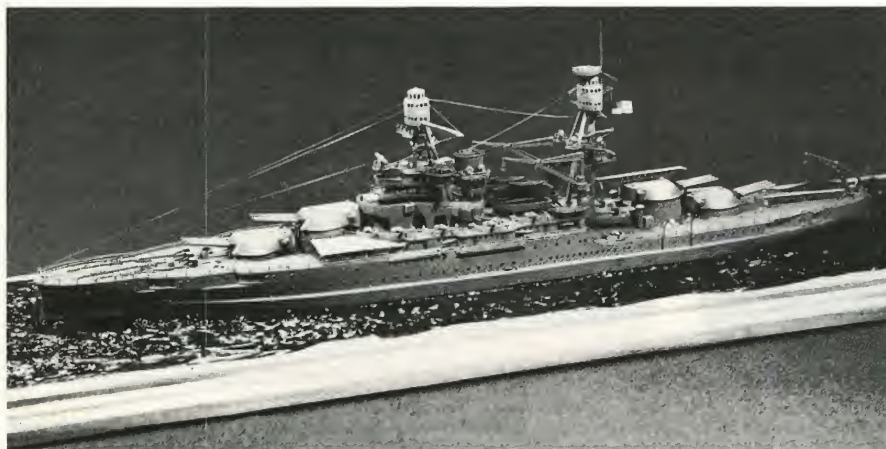
A couple of words of caution: Although additions to the water can be made at any time, subtractions cannot. This gel is strong stuff, and once your ship is in it, that's it. The same is true of waves. Once they have been allowed to dry, they are there for good. Both the gel and the acrylic paints are water soluble and can be cleaned up easily as long as they haven't begun to dry. Don't leave a brush uncleaned for even 15 minutes or it will be ruined.

Producing realistic water is like any other aspect of modeling — it requires some thought and planning beforehand. However, if you give acrylic gel and paints a try for your next water-modeling project, I think you'll be pleased with the ease of application as well as the end result.

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Figs. 3 and 4. When the gel medium dries it turns crystal clear (above). The first step in painting the water is to apply a solid coat of deep blue-green (below).



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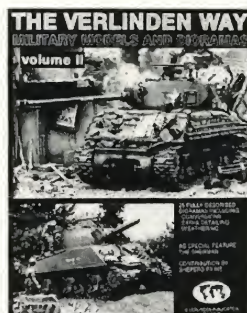
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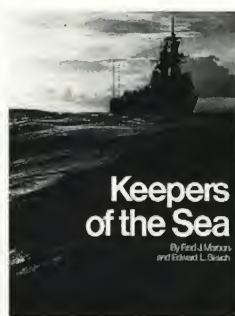
BY BURR ANGLE



The Verlinden Way, Volume II

Belgian modeler Francois Verlinden has published the second in a series of books on military models and dioramas; this 94-page, 6 1/16" x 7 7/8", soft-cover volume concentrates on dioramas showing U.S., British, German, Israeli, and NATO armored vehicles and artillery from World War Two to the present. Twenty-four dioramas, most by the author (one is by Sheperd Paine), are shown in 70 black-and-white and 35 color photos; there are 18 drawings. The text discusses such topics as the arrangement of elements in dioramas; the use of photo backdrops; weathering; simulating water; and modeling sandbags, camouflage, and ammunition. The dioramas and photos are consistently excellent and the text (in English) is clearly written.

The book is published by Verlinden Publications, Verlinden & Stok pvba, Berlaars-estraat 36, 2500 Lier, Belgium.



Keepers of the Sea

Photographer Fred J. Maroon and author Edward L. Beach have produced a 256-page, 9" x 12", hard-cover book showing and describing today's U. S. Navy at its best. The 218 color photos, many of which occupy a full two pages, and the text cover air power, surface combatants, submarines, seagoing logistics, and Navy and Marines training and exercises.

Maroon and Beach treat the Navy's ships, aircraft, and missiles in considerable detail, but focus equally on the men and women of the modern Navy, whom they present as proud, well-trained professionals.

The book is published by the Naval Institute Press, Annapolis, MD 21402; the price is \$45.00 with cloth covers, \$75.00 with leather covers.

U.S. Coast Guard Cutters & Craft of World War II

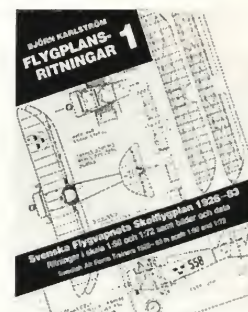


U. S. Coast Guard Cutters & Craft of World War II

Robert L. Scheina has been the U. S. Coast Guard's Historian since 1977, a position which gives him access to all official Coast Guard documents. This 332-page, 9 1/2" x 9 1/2", hard-cover volume describes the ships and boats manned by the Coast Guard in WWII, including Army and Navy vessels crewed by the Coast Guard. There are 223 black-and-white photos, 39 drawings, 3 maps, and many tables and capsule histories of ships.

Because many of the WWII cutters remained in service throughout the 1960s and 1970s and a few are still on duty, the book is also a useful guide to a number of postwar Coast Guard ships.

The book is published by the Naval Institute Press; the price is \$35.95.



Flygplansritningar 1

This 8 1/4" x 11 1/8", 132-page, soft-cover book is a collection of 1/50 and 1/72 scale drawings of 31 aircraft used as trainers by the Swedish Air Force from 1926 through 1983; there are 84 black-and-white photos of aircraft and the text includes explanations of Swedish national insignia used during this period.

The drawings are by Björn Karlström and show such aircraft as the Ö1 CVM Tummeliten, Sk7 Gipsy Moth, Sk14(A) North American NA 16-4M, and Sk 37 SAAB Viggen. The aircraft are shown in front, top, and side views. There are fuselage cross sections and many drawings of aircraft details.

The notes on the drawings are in English and most photo captions are paraphrased in English, so the book can be used by a modeler who doesn't know Swedish. It is published by Allt om Hobby, Box 9185, S-102 73, Stockholm, Sweden; the price including postage is US\$12.00.

Color Charts

Jerry Smith has issued new or revised 4-page, 5 1/2" x 8" charts with the following titles: "F-18 Hornet Colors," "U. S. Navy Car-



rier Colors," "Aggressor Ghost Colors," and "Israeli F-16 Colors." The charts contain drawings of one or more airplanes and a brief description telling how and when a color scheme was used. Each also contains four or five 1½" x 1½" chips cut from 3" x 5" Federal Standard color cards. The charts are published by Modeler's Journal Publications, 526 Penstock Drive, Grass Valley, CA 95945. The price is \$1.00 each plus \$.25 postage for the first chart and \$.10 postage for each additional chart.



German Army Uniforms and Insignia 1933-1945

Brian L. Davis

German Army Uniforms and Insignia, 1933-1945

Published in England in 1971 by Lionel Leventhal Limited, this 224-page, 7" x 9½" book by Brian L. Davis has been reissued in soft-cover by Arco Publishing, Inc., 219 Park Avenue South, New York, NY 10003; the price is \$12.95.

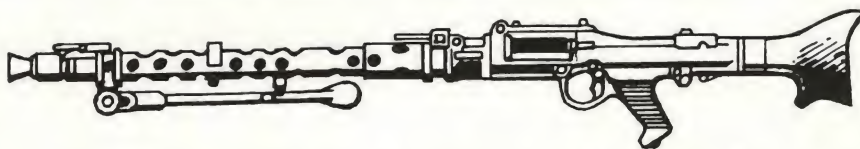
The text discusses insignia and uniforms

worn by the regular German army from 1933 through 1945. There are 232 black-and-white photos, 29 drawings, and 4 pages of color plates. Glossaries present German military vocabulary and ranks with their English equivalents, so the book is also useful as a general reference.



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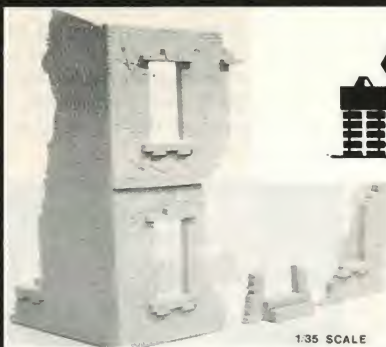
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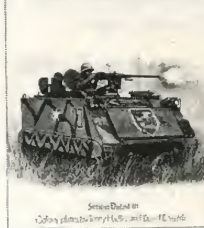
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Streets, Harrisburg, PA 17105, distributes an interesting series of books published in England by Lionel Leventhal Limited. Each of the 16 7 1/4" x 9 3/4", soft-cover volumes now in the *Warbirds Illustrated* line has 64 to 68 pages and contains more than 100 loosely organized black-and-white and color photos of aircraft or missiles. Each photo is accompanied by a brief caption. There is no other text and there are no drawings.

Number 15, *American Warplanes, World War Two-Korea, Volume I*, and Number 16, *American Warplanes, World War Two-Korea, Volume II*, both by Jeffrey L. Ethell, contain color photos exclusively — the printing is excellent. These volumes are \$9.95 each; the others are \$7.95 each plus \$1.50 postage per order.

THE M113 SERIES



The M113 Series

Production of the FMC Corporation aluminum-hull M113 armored personnel carrier began in June 1960 and since then more than 70,000 have been manufactured in many variants, including missile carriers, flame throwers, mortar launchers, bridge carriers, air defense gun mounts, and command posts. At least 53 countries use one version or another of the M113; U. S. inventories total about 24,000, Israel has 6,500, and Switzerland owns 1,475.

This 40-page, 7 1/4" x 9 3/4", soft-cover book by Simon Dunstan contains descriptions of M113 variants, 39 black-and-white photos, 8 pages of color paintings by Terry Hadler and David E. Smith, and a 1/76 scale drawing of an M113A1 Armored Cavalry Assault Vehicle by Steven Zaloga. It is the 34th in a series of books about armored vehicles published by Osprey Publishing, Ltd., 12-14 Long Acre, London WC2E 9LP, England; the price is £3.50.



Concise Guides

Originally published in England by Hamlyn Publishing Group, Ltd., and now distributed in the U. S. by Presidio Press, 31 Pamaron Way, Novato, CA 94947, these are four volumes titled *British Aircraft of World War II*, *American Aircraft of World War II*, *Soviet Military Aircraft* (contemporary), and

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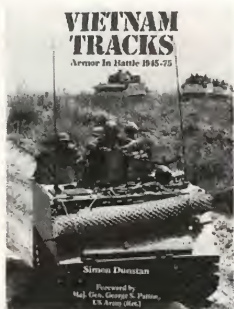
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Military Aircraft of the World (contemporary). The books are hard-cover, 7" x 9 3/4", and range from 208 to 256 pages; each sells for \$9.95.

The contents include brief descriptions of aircraft, specifications, aircraft photos (many in color), small black-and-white 3-view drawings, and many color drawings. There is some duplication of text, photos, and artwork in the volumes *Military Aircraft of the World* and *Soviet Military Aircraft*.



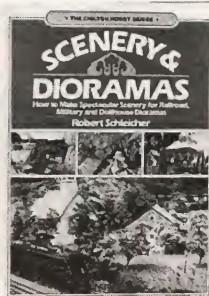
Vietnam Tracks: Armor in Battle, 1945-75

This 192-page, 8" x 11", hard-cover book by Simon Dunstan is a history of armor operations in Vietnam from 1945 through 1975. Chapters cover French, South Vietnamese, U. S. Army and Marines, Australian, and North Vietnamese deployments of tanks, armored personnel carriers, and improvised equipment up to the fall of South Vietnam. There are 214 excellent black-and-white photos. All credits for photos from U. S. Army or Marines archives include negative numbers, a big help to researchers.

The text and captions make it clear that in addition to a cunning and experienced enemy, terrain, climate, vegetation, reptiles, and insects all added to the difficulties of armor troops in Vietnam — even cobras, bees, and red ants were constant dangers. Many vehicles carried a broom, not for housekeeping, but to sweep off ants knocked from nests in trees.

More than 70 percent of armor losses in Vietnam were caused by mines, and as Major General George S. Patton (Ret.) emphasizes in the foreword, these remain a major threat to all armored vehicles.

The book is distributed in the U. S. by Presidio Press; the price is \$20.00.



Scenery & Dioramas

Robert Schleicher's 236-page, 7" x 9 3/8", soft-cover book contains 133 photos (18 in color), 29 drawings by David Etchells, and 25 reference charts listing ingredients and providing concise step-by-step instructions for a number of scenery building methods.

The techniques for simulating landscapes, lakes and rivers, roads, trees, and other objects are up-to-date; Schleicher provides detailed how-to information, mentions products by their brand names, and includes addresses of suppliers.

Most of the text and photos relate to model railroads but the techniques are equally applicable to military and other dioramas. The book is published by Chilton Book Company, Radnor, PA 19089; the price is \$10.95.



The Eastern Front, Armor Camouflage and Markings, 1941 to 1945

Steven J. Zaloga's and James Grandsen's 8 1/2" x 11", 96-page, soft-cover book contains 154 black-and-white photos and 16 pages of color paintings of vehicles and insignia. The authors discuss the armored forces of Germany, the Soviet Union, Bulgaria, Croatia, Czechoslovakia, Finland, Hungary, Italy, Poland, Romania, Slovakia, and Yugoslavia from 1941 to 1945.

The book is printed in Great Britain and published in the U. S. by Squadron/Signal Publications, Inc., 1115 Crowley Drive, Carrollton, TX 75011; the price is \$7.95.



The History and Development of Small Arms

A. J. R. (Sandy) Cormack has written a history of small arms from the fourteenth century to the present that is published in England by Profile Publications, Ltd., and is now distributed in North America by Hippocrene Books, Inc., 171 Madison Avenue, New York, NY 10016; the price is \$16.95.

The 152-page, 7 1/2" x 10 1/4", hard-cover book contains 219 black-and-white photos, 8 pages of color photos, and 24 drawings. The text discusses muskets, rifles, pistols, and machine guns, as well as types of actions and firing mechanisms. There are even brief discussions of antitank weapons, grenades, and mortars. Most of the photos show European and American military weapons from about 1860 through 1980; sporting firearms receive little coverage. Because many of the photos are close-ups of widely used weapons, the book should be especially useful to diorama builders and figure modelers.

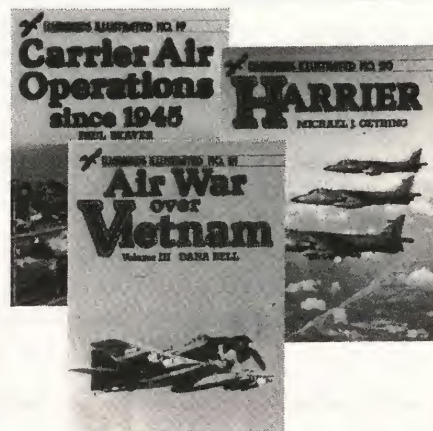
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Messerschmitt Aces

Walter A. Musciano's latest book is a history of the Messerschmitt Me 109 fighter as used during World War Two by German, Finnish, Hungarian, Romanian, and Slovakian pilots, though German pilots receive the most coverage. This 218-page, hard-cover, 8 3/4" x 11 3/4" volume from Arco Publishing, Inc., contains 279 black-and-white photos, 3 maps, and 8 4-view drawings (approximately 1/100 scale) of Me 109s flown by noted pilots. The price is \$17.95.

The text includes a history of the Me 109 in combat from 1938 in Spain through the German surrender in May 1945, as well as 76 short biographies of outstanding Me 109 pilots, several of whom scored more than 200 victories with this aircraft. One chapter describes major Me 109 production variants.

The author emphasizes that unlike the unofficial term "ace" used by the Allied air forces for a pilot who shot down five or more enemy aircraft, the Luftwaffe called its highest scoring pilots *Experten*, or experts, and reserved the term for pilots who consistently excelled in combat.

He also points out that of 28,000 fighter pilots trained by the Germans in WWII, fewer than 1,400 survived the war.



F-105 Thunderchief in Detail & Scale

The Republic F-105 Thunderchief was designed as a supersonic fighter-bomber capable of delivering nuclear weapons. It entered service with the USAF in 1958 and was first used in combat in Vietnam early in 1965. Thereafter, the F-105 flew more missions against North Vietnam than any other fighter and was widely admired for its ruggedness and ability to go home fast.

Bert Kinzey's 72-page, 8 1/2" x 11", soft-cover book on the Thunderchief concentrates on the F-105B, D, F, and G models. It includes 155 photos (29 in color), 1/72 scale 5-view drawings of the F-105D Thunderchief and F-105G Wild Weasel, many tables of aircraft specifications and drawings of aircraft details, and kit and decal reviews.

The book is published by Aero Publishers, Inc., 329 Aviation Road, Fallbrook, CA 92028; the price is \$6.95.

More FSM Book Briefs on page 72

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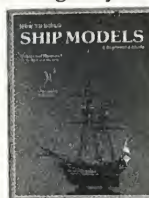
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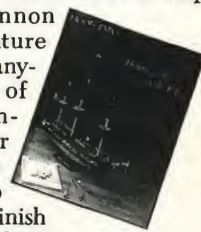
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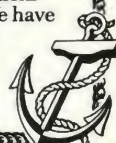
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AD Skyraider in Action

First produced by Douglas in 1945 as the BT2D Dauntless II, renamed Skyraider in February 1946, and again re-designated in April 1946 as the AD Skyraider, this large

single-engine attack plane was the last piston-engine U. S. Navy bomber — the final aircraft of 3,180 produced was completed on February 18, 1957. The Skyraider was the standard Navy attack bomber throughout the 1950s; it fought well in Korea. Sky-raid-ers were also used in Vietnam for ground attack and for rescue missions.

This 50-page, 8 1/4" x 11", horizontal-format, soft-cover book by Jim Sullivan contains 131 black-and-white photos; 3-view drawings of the AD-2, AD-5 (post-1962 designation, A-1E), and AD-6 (A-1H); 13 color paintings by Don Greer; and many drawings of aircraft details. The text discusses Skyraider models AD-1 through 7 and variants. The book is published by Squadron/Signal Publications; the price is \$4.95.



A6M Zero in Action

Designed by Mitsubishi, the first production A6M2 Type 0 Model 11 fighter was manufactured in December 1939. Pre-production models operating in China had already proved that the Japanese had built a land- and carrier-based fighter that was probably superior to any aircraft of its day, a fact the Americans discovered at Pearl Harbor. Code-named "Zeke" by the Allies, more than 10,000 Zeros in many variants, including the A6M2-N floatplane, were produced through 1945.

This 50-page, 8 1/4" x 11", horizontal-format, soft-cover book by Shigeru Nohara contains a history of the Zero; 96 black-and-white photos (most previously unpublished); 3-view drawings of the A6M2 Model 21, A6M3 Model 32, and A6M5 Model 52; 13 color paintings by Don Greer; and many drawings of aircraft details. It is published by Squadron/Signal Publications; the price is \$4.95.



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Paul R. Matt's most recent album is a soft-cover, 96-page, 8 1/2" x 11" book containing articles by several authors on Howard Hughes and the Hughes Racers, the North American AT-6/SNJ Texan, USAAF pilot training in WWII, combat operations of the Douglas DB-7/A-20 Havoc in WWII, and the postwar Republic RC-3 Seabee.

There are 184 black-and-white photos as well as 1/48 scale drawings of the Hughes 1B Racer (short wing), Hughes 1B Racer (long wing), North American AT-6D, and Republic RC-3. The drawings are by Paul R. Matt and present many aircraft details as well as top, side, and end views and cross sections.

The volume is published by Historical Aviation Album, P. O. Box 33, Temple City, CA 91780; the price is \$10.00 which includes postage.



F-14A & B Tomcat in Detail & Scale

The Grumman F-14 Tomcat is likely to continue in service as the U. S. Navy's leading fleet defense fighter well into the twenty-first century. Bert Kinzey's 8½" x 11", 72-page, soft-cover book on the Tomcat contains 156 photos (31 in color), 1/72 scale 5-view drawings of the F-14B, many tables of aircraft specifications and drawings of aircraft details and ordnance, kit and decal reviews, and a bibliography.

The author claims the book is a complete revision of his earlier book on the Tomcat, which was published in 1979 and is now out of print. In particular, the new volume contains an account by F-14 pilot Lt. Larry Muczynski describing how he and Cdr. Hank Kleemann shot down two Libyan fighters over the Gulf of Sidra in 1981.

The book is published by Aero Publishers, Inc.; the price is \$6.95.

Crossroads of Modern Warfare

Drew Middleton, a military correspon-

dent for *The New York Times*, believes that 16 twentieth-century battles have significantly affected the course of history or changed the way in which war is conducted. In his opinion, they include Tsushima, the Marne, Jutland, Cambrai, the 1940 Battle of France, the Battle of Britain, Midway, Stalingrad, Alamein, Imphal-Kohima, Normandy, Chongchon, Dien Bien Phu, Tet, the Battle of the Bridges (U. S. "smart bombs" against North Vietnamese targets), and the Yom Kippur War.

CROSSROADS OF MODERN WARFARE

Sixteen twentieth-century battles that shaped contemporary history
Drew Middleton

This 322-page, 5½" x 8½", hard-cover book contains a commentary on each battle in which Middleton analyzes the behavior of the combatants and reflects on the battle's importance. The text assumes some knowledge of modern history, but the reader need not be an expert military historian to enjoy the book. In addition to the text, there are 18 maps, but no photos.

The book is published by Doubleday & Company, Inc., Garden City, NY 11530; the price is \$17.95.



Long Endure: the Civil War Period

Produced by The Company of Military Historians as the third volume in its series *Military Uniforms in America* and edited by John R. Elting and Michael J. McAfee, this 148-page, 9" x 11½", hard-cover book contains 64 full-page color plates showing uniforms worn by Federal and Confederate soldiers, sailors, and marines of the Civil War period. Also included are uniforms worn by units created by Archduke Maximilian, Emperor of Mexico from 1864 to 1867.

Each plate is accompanied by a page of text that provides a brief history of the unit whose uniform is depicted and that explains when the uniform was worn. The uniforms worn by many militia units in the pre-Civil War period were frequently striking, sometimes being patterned after those worn by French Zouaves — as the war progressed the standard Federal blue and Confederate gray became more common, though by no means universal.

The book is published by Presidio Press; the price is \$35.00.

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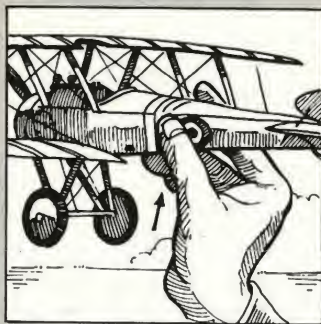
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~ LESSON #1



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STEP #3

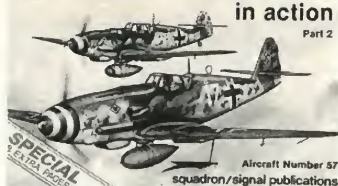
NEVER, AT ANY TIME BEFORE LANDING, SHOULD YOUR HAND LEAVE THE MODEL AS THIS CAN RESULT IN A LOSS OF CONTROL USUALLY FATAL TO THE PLANE.

Greg Hillenbrandt

Messerschmitt Bf 109

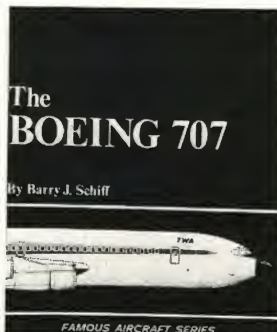
in action

Part 2



Messerschmitt Bf 109 in Action, Part 2

Written by John R. Beaman, Jr., with illustrations by Don Greer, this book describes Bf 109 variants for the F-1 through K models, providing a brief description of each type. It is a 58-page, 8 1/4" x 11", horizontal-format, soft-cover volume with 99 black-and-white photos, 13 color paintings showing aircraft markings, and many drawings of aircraft details. There are 3-view drawings of the F-4, G-6, and G-10 versions. It is published by Squadron/Signal Publications; the price is \$4.95.



The Boeing 707

First published in 1967 and now in its third printing, this 80-page, 8 1/2" x 11", soft-cover book by TWA 707 pilot Barry J. Schiff tells the story of Boeing's decision to build the 707 prototype as a private venture with no orders on hand, then describes the history of the 707 prototype, the Boeing Model 367-80, usually referred to as the "Dash 80." Later chapters describe other Boeing jets as well as competing aircraft from Douglas, Convair, and Lockheed, and take the reader along in the cockpit of a 707 flying from Los Angeles to New York.

The Dash 80 first flew on July 15, 1954; scheduled airline service with a 707 began on a Pan Am flight from New York to Paris on October 26, 1958. The book provides an

excellent look at the early years of jet airliners through 1967. In addition, there are brief discussions of military versions of the 707 — the KC-135, C-135, and VC-137.

There are 122 black-and-white photos and many drawings by John Preston. The book is published by Aero Publishers, Inc.; the price is \$7.95.

NINTH AIR FORCE

STORY



Ninth Air Force Story

The Ninth Air Force was formed from the United States Army Middle East Air Force (USAMEAF) on November 12, 1942, after units of the USAMEAF had seen action in the Mediterranean and North African theaters providing ground support to the British Eighth Army. The Ninth's fighters and tactical bombers then took part in Operation Torch and the invasions of Sicily and Italy.

On October 16, 1943, a new Ninth Air Force was created in England from where its planes attacked targets in France in preparation for the Allied invasion of Normandy and escorted heavy bombers of the Eighth Air Force. Shortly after the invasion, the Ninth moved to France and assisted U. S. Army operations in France and Germany until the end of the war.

Although Kenn C. Rust has written an earlier history of the Ninth, the publisher claims that Rust's new book has been thoroughly revised. This soft-cover, 64-page, 8 1/2" x 11" book has 108 black-and-white photos, many tables of operational statistics, lists of aircraft markings and color schemes, and a list of Advanced Landing Grounds in Europe during 1944 and 1945. The text offers a concise history of the Ninth and its predecessor units. The book is published by Historical Aviation Album, P. O. Box 33, Temple City, CA 91780; the price is \$7.95 plus \$1.00 postage.

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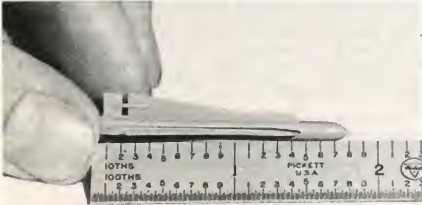


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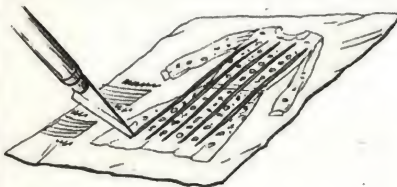
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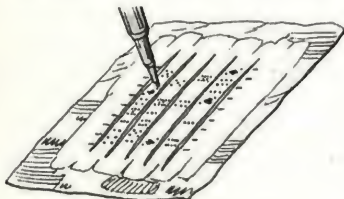


Decimal ruler. Have you ever used an electronic calculator to figure a scale problem and it gives you an answer like 3.77 inches? How much is .77 of an inch? You can either employ complex conversion formulas or you can purchase a ruler graduated in tenths and hundredths of an inch. General Hardware makes a 12" model (No. 1216) which also features 32nds and 64ths on the other side. Pickett makes two 6" models (Nos. 419M and 33E).

Paul Boyer

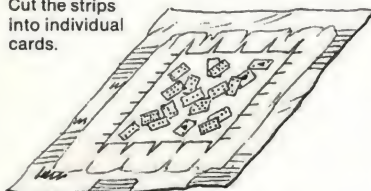


Cut catalog page image into thin strips.



Paint back side white and add card faces with ink or paint.

Cut the strips into individual cards.



Diorama details. Pictures of wallpaper and fabrics found in catalogs from Sears or J. C. Penney can be used as wallpaper, draperies, and rugs in dioramas. Playing cards can be made by cutting small pieces from these pictures, painting the reverse side white, and carefully painting on the face with red and black paints or inks.

Bruce Culver



Putty from Styrofoam. Here's another home-brew putty. Cut up expanded polystyrene packing material and dissolve it in liquid styrene cement. It dissolves much quicker than sprue chips and it's easier to cut. It also seems to dry quicker. If it strings, just add more polystyrene.

Dick Hirdes



Paint knife. The "artist's spatula" pictured in "The search for the perfect filler putty" (Summer 1983 FSM), is actually a paint knife which is available in several sizes. This is the smallest one I could find and it costs about \$5.00. It is thin and flexible with a blade that is small enough to apply putty to my 1/72 scale aircraft models.

Will Reynolds



Foil seals. The thin aluminum foil wrapped around some candy bars makes excellent replacement seals on paint bottles. Clean off the bottle threads and cap, place a piece of foil over the opening, and screw on the cap. The foil keeps the paint from drying out and the thread and cap clean.

Ed Kolbush

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Wood grain. You can simulate the wood grain on a wooden propeller with shoe polish. First paint the prop tan. When it is dry, apply ordinary brown shoe polish with either a shoeshine brush or an old toothbrush. Keep applying the polish until you achieve the shade you want. Wipe off any excess polish with a tissue. Since shoe polish dries slowly, seal it with a clear coat of enamel or lacquer. *David Longe*



Diamond texture pattern. I found some polyethylene packaging material wrapped around glassware that had a texture similar

to that found on interior panels in helicopters and on nonskid panels on armored vehicles. I attempted to bond this .001" material to sheet styrene with liquid glue, but it wouldn't stick; polyethylene is resistant to most adhesives. But the liquid glue softened the styrene enough to produce an impression of the sheet's pattern onto its surface. The result is ready-to-use sheet styrene with a diamond grid pattern. *Alan Ernat*



Tinted windows. Almost any flat or slightly curved canopy can be tinted with commercial artist's color films. These are gummed-back, transparent acetate sheets that come in many colors and are available at art or drafting supply stores. Brands to look for are Chartpak or Zip-a-Tone, but be sure to get the glossy surface. Simply cut a piece slightly larger than needed, peel off the plastic backing, and burnish the tint onto the inside of the canopy with your finger. If it doesn't work the first time, peel it off and try again. *Pete Harlem*

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- 1B. Publication No. 679590
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	Average No. copies each issue during preceding 12 months	Actual No. copies of single issues published nearest to filing date
A. Total No. of copies printed (net press run)	54,758	57,370
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	20,319	20,720
2. Mail subscription	6,208	7,000
C. Total paid circulation (sum of B1 and B2)	26,527	27,720
D. Free distribution by mail, carrier or other means: samples, complimentary, and other free copies	291	280
E. Total distribution (sum of C and D)	26,818	28,000
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	4,508	6,818
2. Returns from news agents	23,452	22,552
G. Total (sum of E, F1, and F2—should equal net press run shown in A)	54,758	57,370

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